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$4-Billion Negro Demand p. 38
Solids Separation Report p. 63

APRIL 1961

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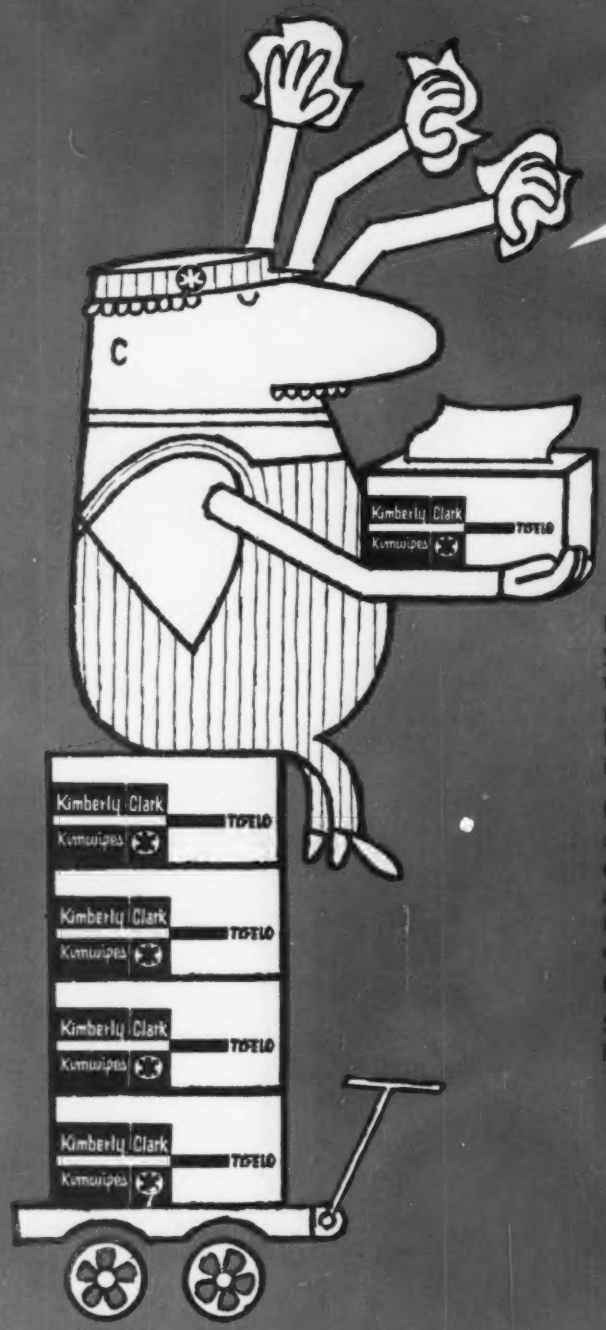
FOOD ENGINEERING

FOR BETTER MANAGEMENT IN MANUFACTURING

A CHILTON PUBLICATION

Pillsbury Trains With Business Games p. 47



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FOOD ENGINEERING

FOR BETTER MANAGEMENT IN MANUFACTURING

A CHILTON PUBLICATION
VOL. 33 NO. 4

April, 1961

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SPECIAL FE REPORT

Modern separation units offer many opportunities for process and product improvement, cost-cutting. Here's a timely review of their design, operation, and applicability to specific tasks.—p. 63.

Little wonder that today's food processors have a voracious appetite for MSG: Its effectiveness as a flavor enhancer of the widest variety of foods and its improved economies of use create an ever-increasing demand. Merck meets the demand with a 100% increase in MSG production capacity. This $2 million plant expansion puts Merck in the best possible position to supply your MSG needs.

Merck produces MSG by a new and technically advanced fermentation process that utilizes raw materials available in unlimited supply—and that assures unsurpassed quality. Make Merck your basic source for MSG and also enjoy the benefits of a research and technical service program that has solved many of the food industry's toughest problems. Call your Merck Representative or contact Rahway directly for full details on delivery, price and quality of Merck MSG.

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MERCK & CO., INC. • RAHWAY, NEW JERSEY

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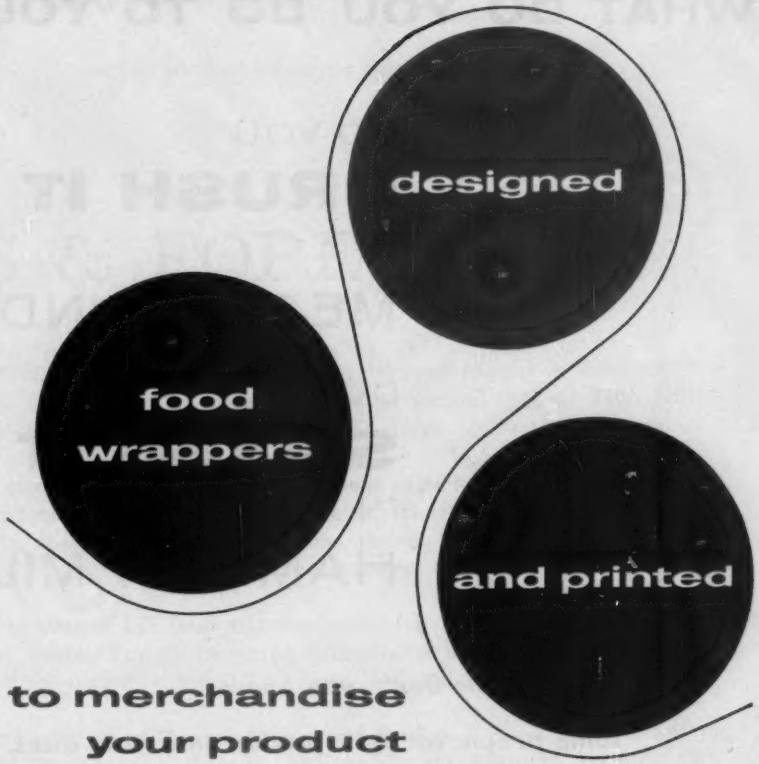

to merchandise your product

FOOD WRAPPERS of *Non-Toxic—Pure White—vegetable parchment*

DESIGNED to make your brand attractive and outstanding

AND PRINTED with colors that make your product appetite appealing

We have the facilities to make your moist-food wrapper.
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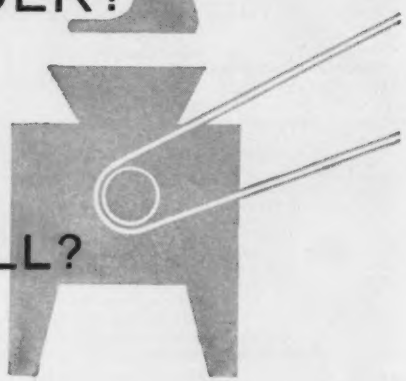
Margarine Wrappers
Meat Wrappers
Milk Can Gaskets
Multi-Wall Bag Liners
Parchment Circles
Parchment Duplicating Masters
Parchmentized Kraft
Poultry Box Liners
Poultry Wrappers
Release Parchment
Sausage Wrappers
Sliced Cheese Interleaving Parchment
Special Parchments for Frozen Foods
Tamale Wrappers
Tri-Wrap & Duo-Wrap for Smoked Meats
Vegetable Crate Liners
Vegetable Shortening Carton Liners

Silicone • Mycoban • Quilon & Dry Waxed Parchment
Clean Food Paper—Interfolded and Wall Pocket Cartons

WHAT DO YOU DO TO YOUR PRODUCT?

DO YOU
CRUSH IT
IN A
MEAT GRINDER?

DO YOU
SMASH IT
IN A
HAMMER MILL?



some people don't, you know,

some people cut their product into little dices.

PICKLES for the meat industry are now cut into ¼" or ⅜" cubes.

PICKLE RELISH of high quality is now cut into ⅛" cubes or pieces of ⅛" x ⅛" x ¼".

CHEESE is now being cut into little and big dices. Roquefort cheese is easily diced at a temperature of 10°F.

MEAT with little fibre content such as bologna is cut into small dices for sandwich spreads and other products.

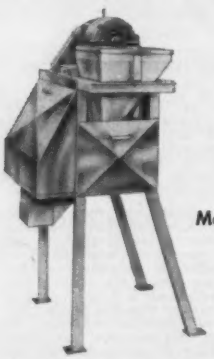
CHERRIES for ice cream dip or other purposes, are cut into little dices.

ALL KINDS OF FRUIT are cut into various small dice sizes for use in numerous products.

NUMEROUS PRODUCTS are now also being cut into julienne strips or thin slices with the "RA".

All of this is accomplished with the Urschel Model "RA" at capacities of up to 10,000 pounds per hour.

We'll be glad to test *your* product in our modern product cutting research kitchen. Write us today.



Model "RA" Dicer

PRECISION HIGH-SPEED FOOD CUTTING EQUIPMENT

URSCHEL
LABORATORIES INC.
VALPARAISO, INDIANA

Designers and manufacturers of precision, high speed cutting equipment for food products.

TRENDS & FORECASTS

Although $¾ billion under January, personal income in February was 2½% above same month in '60 and at annual rate of $406 billion. Peak in October '60 was $410 billion.—Dept. of Commerce.

Per capita food index in '60 was about same as '59 but 3% above '47-'49 average. Up were meat, chicken, cheese, margarine, processed fruits, fresh and frozen vegetables, melons and potatoes. Down were eggs, lard, fresh fruits and sweet potatoes.—USDA.

Net income of 118 food manufacturers fell 1% in '60 to $531,487,000, after taxes. For 28 beverage firms, drop was 8% to $138,830,000. Food chain profits rose 3%.—First National City Bank.

There are 16½ million persons over age 65 in U.S.—about 1 out of 11, up 34.7% since '50. Gain is 133% in Florida, 104% in Arizona. California and New York gained most numerically.

Food and beverage manufacturers are spending at $1 billion annual rate for new plant and equipment. This is 9.6% more than '60 rate. It compares with 3% drop for all manufacturing.—Dept. of Commerce.

Family food expenditures in supermarkets increased 278.8% between '47 and '59. Additional gain of 42.3% is forecast by '65. Total food expenditures per family increased only 14.2%, with 11.5% forecast.

Margarine gained another 5% in '60 for record 1,695.2 million lb. Gain is 84% since '50. Per person consumption is 9.2 lb.

Canned tuna pack hit record 15.2 million cases in '60, up 6% over '59. Oyster harvest was near all-time low of 59 million lb.

Record candy consumption exceeded 3 billion lb., for 3% gain last year. Some 83 million pieces of candy were eaten daily on average.

Sour cream sales skyrocketed 37% to 100 million lb. from '57 to '59. Additional gain of 25% is indicated for '60, says USDA.

Postwar high for wheat flour exports was achieved last year at 41.9 cwt., up 13.5%. Flour milling gained 4 million cwt., or 1.6%.

Prospective acreage of green peas for processing is 13% above '60, or 394,610 acres. Peas for freezing are up 20%; for canning, 9%.

Tomato acreage will be 7% greater, or 301,400 acres. Spinach is put at 67,400 tons, down 1.5%, according to Crop Reporting Board.

World cocoa bean production for '60-'61 is estimated 13% above last season or 2,530 million lb., by USDA.

See Developments to Watch p. 13

a little cmc makes a big difference

Processors of frozen fruit pies find that a little Hercules Cellulose Gum, purified CMC, in the fillings makes a big difference. Hercules Cellulose Gum is used in these items, such as this cherry pie, because it makes it easier to control viscosity and gives the pies freeze-thaw stability. At the same time, cellulose gum combined with the starch thickens juices to the proper consistency for handling and eating; prevents floating or settling of the fruit; and contributes to more desirable gel texture. The filling will be clearer and brighter and show the fruit to best advantage.

For better frozen pies and constant formulations next time try a little cellulose gum. It makes a big difference.

For details write to Hercules.

Hercules® Cellulose Gum

HERCULES POWDER COMPANY
INCORPORATED

Hercules Tower, 910 Market Street, Wilmington 99, Delaware

VC61-2

CIRCLE 8 ON INQUIRY CARD

Schedule of Events

April

9-12—U. S. Wholesale Grocers Assn., meeting, Americana Hotel, Bal Harbour, Fla.

9-13—American Assn. of Cereal Chemists, meeting, Baker Hotel, Dallas, Tex.

9-13—American Industrial Hygiene Conference, Sheraton-Cadillac Hotel, Detroit.

10-13—American Management Assn., 30th National Packaging Exposition, Lakefront Exposition Hall, Chicago.

11-12—Food Engineering Conference, Food Science Dept., Michigan State Univ., East Lansing.

13-15—National Independent Meat Packers Assn., meeting, Palmer House, Chicago.

14-19—National Fisheries Institute, convention & show, Shoreham Hotel, Washington, D. C.

16-19—Cooperative Food Distributors of America, meeting, Palmer House, Chicago.

30-M4—American Society of Brewing Chemists, meeting, Granada Hotel, San Antonio, Tex.

May

3-13—5th U. S. World Trade Fair, New York Coliseum, NYC.

7-10—Super Market Institute, meeting, McCormick Place, Chicago.

7-11—Institute of Food Technology, convention, Statler Hotel, NYC.

9-11—Material Handling Institute, Inc., show, Philadelphia Trade & Convention Center, Philadelphia, Pa.

14-17—Flavoring Extract Manufacturers' Assn., meeting, Savoy-Hilton Hotel, NYC.

21-24—Biscuit & Cracker Manufacturers Assn., and Biscuit Bakers Institute, meeting, Mayflower Hotel, Washington, D. C.

HORS D'OEUVRES

▸ Takes ten years and $1½ million to ready a new and useful agricultural chemical for market, says U. S. Rubber executive. As many as 5,000 might be developed to find one with commercial possibilities. Then there's FDA.

▸ **Two Americans were castaways on a desert island in the Pacific for 3 years. One day one of them spotted a bottle being washed ashore—a new Coca-Cola king-size. "My goodness," he shrieked to his friend, "we've shrunk."**

▸ Modern supermarket mystery: Collapsing plastic bottles! B. T. Babbitt sleuths investigate. Sunlight found to be culprit. Opacifier added. Case closed.

▸ **Half a dozen oysters contain only 56 to 70 calories, but are a powerhouse of vitamins A and B, iron and calcium. It's true what they say about oysters!**

▸ High moisture content in processed meats might lower the price, increase sales, and improve the nutritional level of diets. So observes Reliable's John Thompson as he flips up the other side of the quality coin.

▸ **Research reveals that water between meals aids metabolism of carbohydrates to keep your energy at high level. Who says the office water fountain is a work waster?**

FREE!

DUST CONTROL BULLETINS

You can save time when planning and save money when buying if you'll send for these DAY dust control bulletins. Each contains valuable information about dust control equipment and systems. Here's general information plus useful technical data and specifications. Ask for any bulletins which interest you — they're free. Check coupon below and mail toDAY.

BULLETIN G-30—Describes the DAY Type "RJ" filter. An all purpose, versatile unit. Bulletin gives operating features, dimensions and specifications.

BULLETIN D-20 — Dual-Clone dust separators — noted for their low resistance and high cleaning efficiency. Easy to install, no maintenance, no moving parts.

BULLETIN I-585 — Industrial Fans. Complete with helpful selection charts, capacity tables, dimensions and specifications. Information on special types and arrangements included.

BULLETIN F-75 — Reverse Jet Dust Filter Facts. Complete with specifications, typical equipment layouts, capacity and performance tables for DAY type "AC" filter.

BULLETIN N-578 — Gives complete information about Style "A" rotary valves. Construction features, specifications, dimensions and applications.

"SCHLITZ DEFEATS DUST" — FOOD ENGINEERING magazine reprint describes all out dust control for 3½ million bushel Schlitz grain elevator. Request Bulletin "Schlitz" Defeats Dust."

"EFFICIENT DUST SNATCHERS" — Bulletin describes DAY's part in providing maximum safety and good housekeeping for starch packing building of large food processor.

BULLETIN 510—DAY Unit Dust Collectors. Complete, low cost unit designed for plants or applications where central dust control systems are not practical.

BULLETIN 576 — "HV" heavy duty dust separator. Rugged construction and lower initial cost than many light gauge galvanized type cyclones.

The **DAY** *Company*

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Minneapolis 13, Minnesota

In Canada:
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15 Brydon Drive, Rexdale (Toronto), Ont.

Please send Bulletins checked below:

☐ Bulletin G-30 ☐ Bulletin F-75 ☐ "Efficient Dust Snatchers"
☐ Bulletin D-20 ☐ Bulletin N-578 ☐ Bulletin 510
☐ Bulletin I-585 ☐ "Schlitz Defeats Dust" ☐ Bulletin 576

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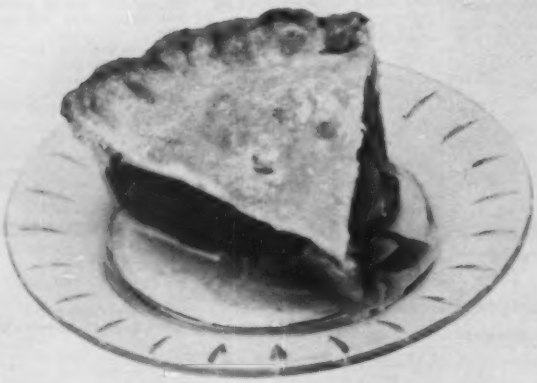
CANNED VEGETABLES
Prevents pre-processing browning

FRUIT DRINKS
"Peps up" as an acidulant

BABY FOODS
Improves palatability

BREADED SHRIMP
Slows enzyme action;
reduces bacterial growth



FRUIT PIE FILLINGS
Increases fruit content;
improves flavor

CANNED SOUPS
Enhances flavor

CANNED FIGS
Reduces autoclave temperature; improves flavor and texture

MAYONNAISE
Extends shelf life

PRUNE JUICE
Accents flavor

VEGETABLE JUICE COCKTAIL
Adjusts acidity; improves flavor

What can lemon juice do for your product?

These are a few of the processed foods that *look* better, *taste* better and *sell* better, thanks to Exchange Concentrated Lemon Juice.

They range from ocean bottom seafood to treetop fruit.

Your product may be one that can be transformed from "good" to "superior" by the use of lemon juice as a flavor enhancer. Loss from spoilage or discoloration can often be cut—even eliminated—by using it in processing.

Exchange Lemon Juice can be a selling ingredient of distinction on your label at a cost of just pennies. Tell us what your product is. We'll tell you if and how lemon juice can improve it. Just use the coupon.

Sunkist Growers

Products Sales Dept., 720 E. Sunkist St.
Ontario, California

GENTLEMEN: *Our product is* _____

_____

_____. *How can lemon juice help?*

NAME _____

ADDRESS _____

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STATE _____

Exchange

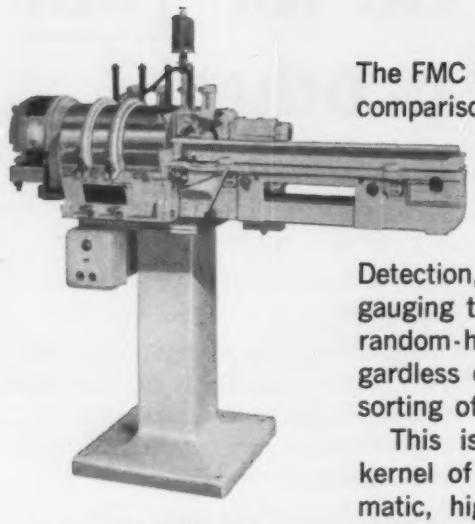
NEW FMC CORN CUTTER

FOR GREATEST YIELD

[AT 120-150 EARS A MINUTE]

AT LOWEST COST

[SAVE 30% ON LABOR ALONE]



MODEL **3AR**
UNIVERSAL
CORN CUTTER
WITH
AUTOMATIC
SIZE
DETECTION

The FMC Model 3AR Universal Corn Cutter is without comparison in operating efficiency, high production and yield, low operating cost. It is the only cutter designed to handle both whole kernel and cream-style packs.

Featuring A. S. D. — "Automatic Size Detection," the new Model 3AR utilizes feed roll gauging to pre-open knives which cut mixed ears of random-harvested corn to any desired depth, regardless of length, size or taper. No pre-grading or sorting of ears is required.

This is the cutter that meticulously cuts every kernel of corn from the cob in a continuous, automatic, high-speed, no-waste operation — while fully protecting quality every inch of the way. Other exclusive features include double rotary heads, precision-balanced knives, in-motion adjustment and quick-release lever, to name a few. Get full details on the remarkable 3AR Cutter and other FMC "Stalk to Storage" specialized corn equipment.

New FMC Corn Cutter Bulletin No. 604W now available on request. Write for your copy today.

Putting Ideas to Work

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◄ CIRCLE 11 ON INQUIRY CARD

CIRCLE 12 ON INQUIRY CARD

DEVELOPMENTS TO WATCH

Britain's first large-scale freeze-drying plant is dehydrating coffee extract commercially and milk experimentally. Mitchell Engineering is building plant for product tests by food firms.

Computer is continuously controlling formulation of sausage mix in Midwest plant to achieve optimum fat content. On-stream fat analyzer feeds control information to computer.

Butter is whipped in continuous ice cream freezer into which it is fed by printer. Chilled water is refrigerant. Capacity of 2,000 lb/hr. is machine-filled into 8-oz. cups.

Miniature electro-mechanical recorder charts time-temperature experience of frozen food during distribution. Experimental Minneapolis-Honeywell device costs $1, is small as cigarette.

New ultrasonic unit counts food cases on conveyor without contact.

Sugar will kill nematodes in soil by dehydration. Water passes out of their bodies to dilute sugar solution in soil, USDA finds.

Unidentified substances from grape leaves inhibit enzymatic breakdown of cellulose and pectin in brined pickles, USDA reports.

Program of chemical analysis of fruits and berries to keep pesticides out of jams and jellies has been set up by National Preservers Assn. Consultant will test samples chromatographically.

New electronic colorimeter grades tomatoes by measuring juice color. USDA is putting it into industry for experimental use.

Few seconds exposure to high-frequency electric field kills some species of insects in stored grain, research by USDA indicates.

New electrobalance weighs samples up to 1.2 g. with 1-mg. accuracy. It is not affected by temperature, vibration or level. Balancing torque is produced by current in coil in magnetic field.

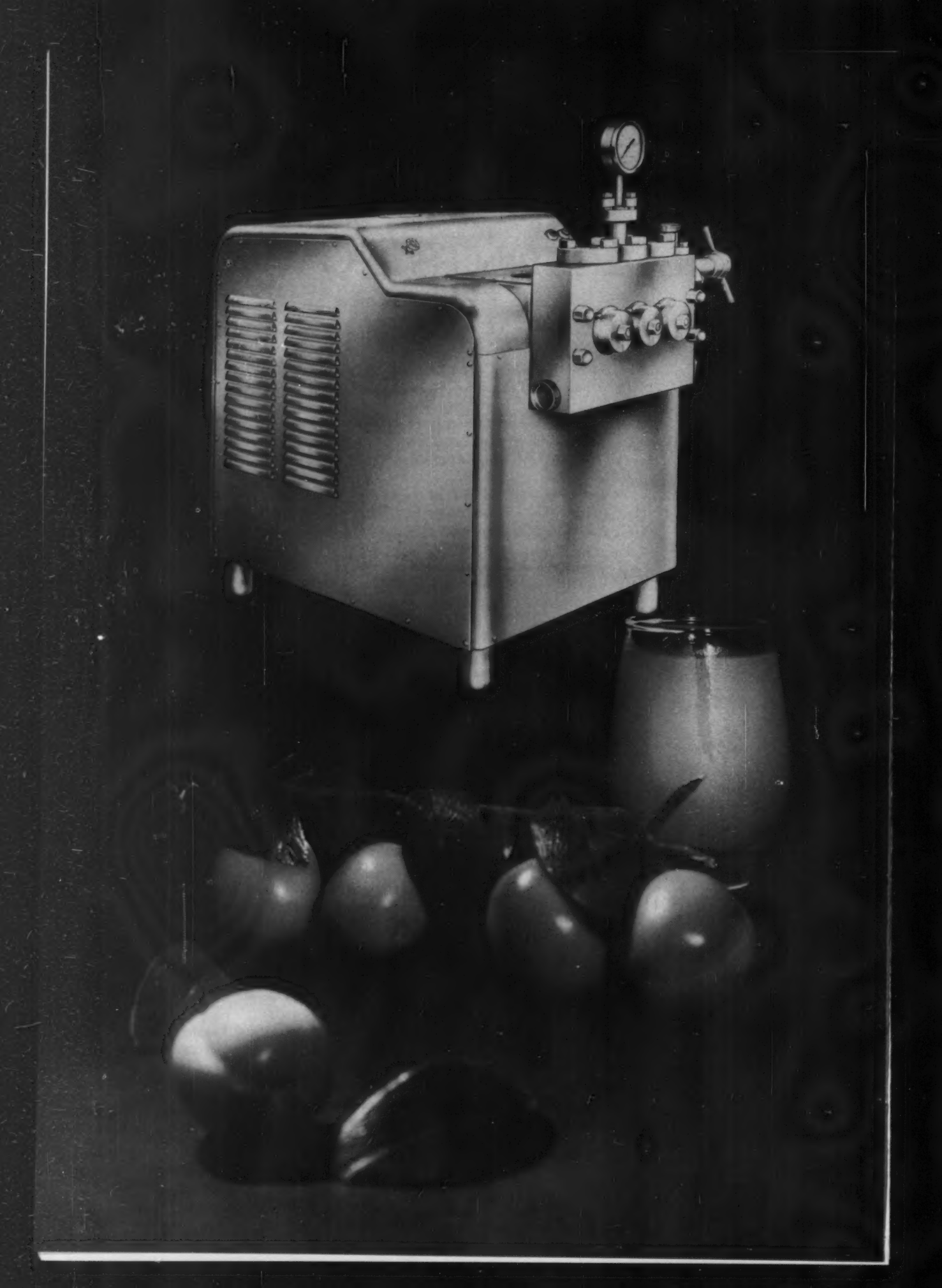
See Who's Building What p. 17

Dehydrated red sour cherries suitable for pies, and having excellent storage life, are Oregon State development. Thawed frozen fruit is sulphited and dried 1½-2 hr. at 190F., 8-10 hr. at 145F.

Washington Report p. 21

Nutrament is new 400-cal. balanced food for those who skip or skimp on meals. It's another Mead Johnson development.

Food-grade silicone emulsion for coating packaging paper to achieve controlled release from fatty product is GE innovation.



Cherry-Burrell prevents flavor fallout in apricot nectar

One Eastern processor of apricot nectar had a problem with his product. The apricot concentrate separated from the water and fell to the bottom. And with it went the flavor. Since he packaged his nectar in glass, the unattractive fallout hurt sales. He asked Cherry-Burrell to solve his problem.*

Cherry-Burrell engineers studied the situation, tested the product in Cherry-Burrell laboratories, and recommended a Superhomo Homogenizer. The product was shot through the Cherry-Burrell Superhomo under tremendous pressures and velocities, subjected to sudden, violent changes of direction. This *explosive* action broke up the concentrate globules into tiny flavor drops that stayed in suspension, never separated. The process gave the nectar an appetizing appearance, even improved its flavor. The Superhomo recommended is just one in a long line of Cherry-Burrell homogenizers.

Highly trained technicians will test *your* product without obligation, in a Cherry-Burrell laboratory. They will show you how Cherry-Burrell food processing equipment can help you improve your operation and profit position. Your specialists are invited to participate in the testing. Call or write Cherry-Burrell today.

** Case history on request*

EQUIPMENT FOR HOMOGENIZING, HEATING, COOLING, FLAVORIZING, STORING, SEPARATING, FREEZING, MIXING, PACKAGING AND CONVEYING. WRITE FOR YOUR FREE CATALOG.

CHERRY-BURRELL CORPORATION
CEDAR RAPIDS, IOWA

From beefsteak to biscuits . . .

MILES HAS A WAY WITH FOOD

to prolong shelf life, protect color, tenderize, adjust pH, speed processing!

WITH HIGH-PURITY CITRIC ACID, produced by Miles' unique deep-fermentation process, you multiply the benefits of this versatile ingredient. And Miles is an experienced large-volume producer, producing quantities that assure you of a steady supply . . . a midwestern source with over 70 warehouses located strategically, stocked abundantly.

WITH ANTIOXIDANTS, where accurate formulation is important to you from the standpoints of economy and product quality, Miles is making important contributions. **CONSIDER TAKATABS,** for example. Here is sodium erythorbate (isoascorbate) in convenient tablet form — accurately premeasured units. Waste and spillage are virtually eliminated, and the possibility of "human error" in the plant is greatly reduced. For the small-quantity user, Takatabs cost less in the long run.

WITH A WIDE CHOICE OF ENZYMES, Miles is not limited to a few products from which to choose the proper enzyme to do *your specific job.* Selecting from the widest range of commercial enzymes available — manufactured by its famous Takamine plant — Miles' sales and technical service personnel can pick the enzyme to meet your requirements accurately, objectively and economically — not just "come close."

Get the additional information you need about the products Miles makes for the food industry. Write:

MILES CHEMICAL COMPANY DIVISION OF MILES LABORATORIES, INC., ELKHART, INDIANA • CONGRESS 4-3111

Who's Building What

Monthly Reports: These food firms will spend $30,036,509 for expansion.

Contracts Awarded

Arkansas Grain Corp., Stuttgart, Ark., soybean storage tanks, $2,000,000.

Campbell Soup Co., Camden, N. J., plant addns., $110,000.

H&B Packing Co., Waco, Tex., meat packing plant, $115,000.

Idaho Beverages, Lewiston, Idaho, bottling plant, $130,000.

Lamp-Weston, Inc., American Falls, Idaho, potato processing plant, $300,000.

Lindsay Ripe Olive Assn., Lindsay, Calif., warehouse, $129,875.

Louis Dreyfus Corp., Portland, Ore., grain handling facilities, $110,000.

National Biscuit Co., Roanoke, Va., warehouse, $120,000.

O'Donnell-Usen Fisheries Corp., Gloucester, Mass., plant, $1,000,000.

Safeway Stores, Inc., Denver, Colo., produce warehouse addn., $225,000; Denison, Tex., cornoil products production plant, $200,000.

Sealtest Food Div., Paoli, Pa., cold storage plant, $110,000.

Snowflake Bakery, Waimalu, Hawaii, bakery, $1,500,000.

Sun-Maid Raisin Growers, Fresno, Calif., storage & packing plant, $3,000,000.

Venus Foods, Inc., Buena Park, Calif., food processing plant, $1,416,634.

Whitson Food Products, Denton, Tex., warehouse, $110,000.

Proposed Projects

Ambrosia Chocolate Co., Milwaukee, Wis., factory-office addn., $2,000,000.

Bowling Green Coca-Cola Bottling Works, Bowling Green, Ky., bottling plant, $150,000.

Canada Dry Bottling Co., Wethersfield, Conn., bottling plant, $200,000.

Canadian Dressed Meats, Lethbridge, Alta., meat packing plant, $250,000.

Charles E. Hires Co., Philadelphia, plant, $1,000,000.

Coca-Cola Bottling Co., Lubbock, Tex., bottling plant, $110,000.

Consolidated Dairy Products Corp., Seattle, Wash., milk plant addn., $1,000,000.

DeLuxe Italian Bakery, Runnemede, N. J., bakery, $350,000.

Doane Canning Co., Big Stone Gap, Va., cannery, $120,000.

Fraser Valley Milk Producers Assn., Burnaby, B. C., plant, $3,500,000.

General Foods Corp., Arlington, Tex., refrigerated warehouse, $1,335,000.

Hershey Chocolate Corp., Smiths Falls, Ont., plant, $7,000,000.

Jacobs Packing Plant, Nashville, Tenn., meat packing plant, $125,000.

Jay's Potato Chip Co., Chicago, Ill., food processing plant, $200,000.

L. N. Renault & Sons, Inc., Egg Harbor, N. J., winery expansion, $500,000.

Mid-Tex Milk Producers Assn., Austin, Tex., milk receiving station, $110,000.

Nehi-Royal Crown Bottling Co., Greenville, S. C., bottling plant, $150,000.

Pepsi-Cola Champaign-Urbana Bottling Co., Champaign, Ill., bottling plant, $150,000.

Skinner Mfg. Co., Omaha, Neb., macaroni mfg. plant, $750,000.

Smithfield Meat Processors, Inc., Smithfield, N. C., meat processing plant, $400,000.

Sun-Alta Potato Processors, Ltd., Taber, Alta., dehydrated potato plant, $200,000.

Swift & Co., South St. Paul, Minn., packing plant, $1,000,000.

Whitson Food Products, Denton, Tex., warehouse, $110,000.

Other Construction News

Seeman Bros., Inc., signed contracts for construction of a frozen food processing and cold storage plant on Prince Edward Island, Canada.

California Vegetable Concentrates, Inc., announced plans to build a plant for processing of dehydrated white onions on 40-acre site in El Centro, Calif.

Hermann Pabst Co. plans construction of an ultra-modern bottling plant in Dusseldorf, West Germany.

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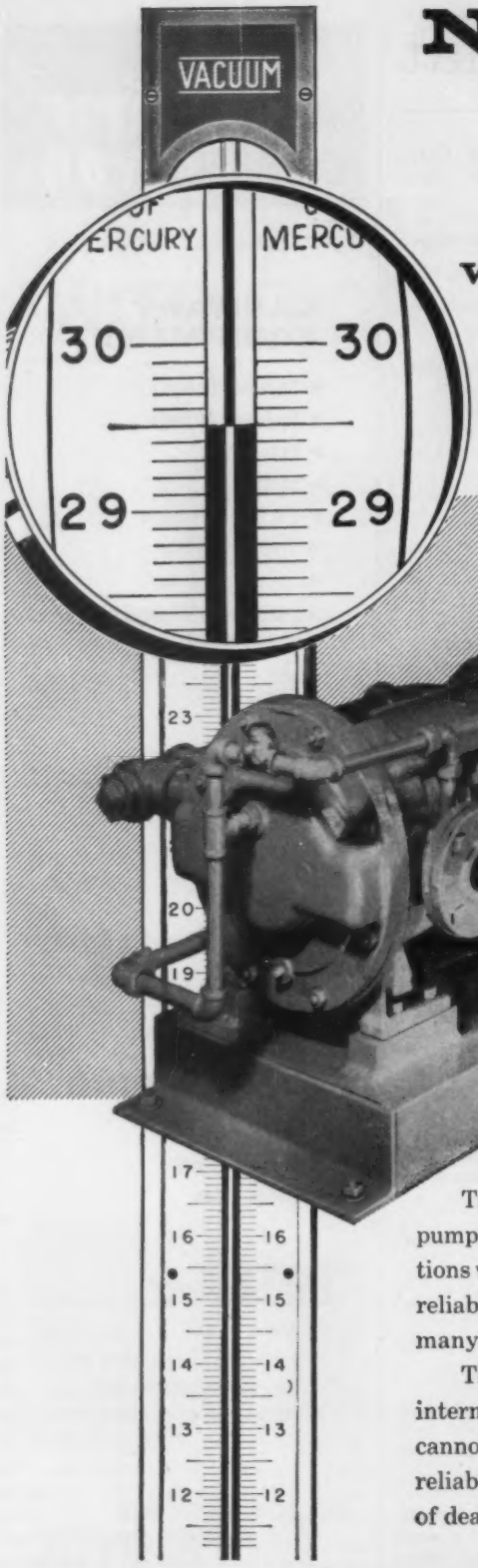
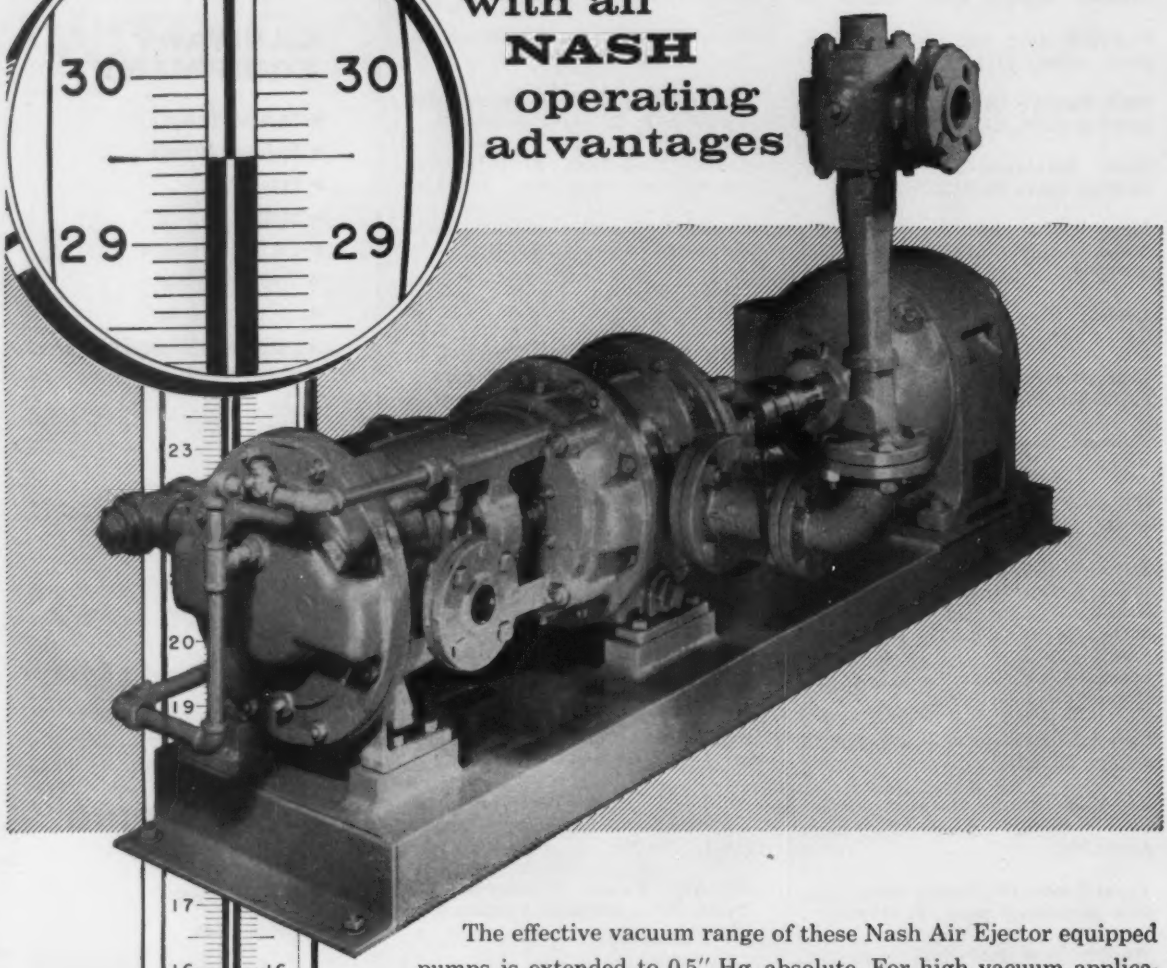


with all NASH operating advantages



The effective vacuum range of these Nash Air Ejector equipped pumps is extended to 0.5″ Hg. absolute. For high vacuum applications where hard to handle service conditions are present and where reliability of pump operation is imperative. These pumps can handle many saturated or wet gases including solvent and acid vapors.

These pumps have but one internal moving part, and use no internal lubrication. The vacuum produced is non-pulsating. They cannot be damaged by a slug of liquid, and will provide the same reliability and long life even if the operating cycle consists mostly of dead end service. Please request Bulletin 387-A.

NASH ENGINEERING COMPANY

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CIRCLE 19 ON INQUIRY CARD ➔

KEEP FAITH WITH NATURE – GUARD HER GOODNESS

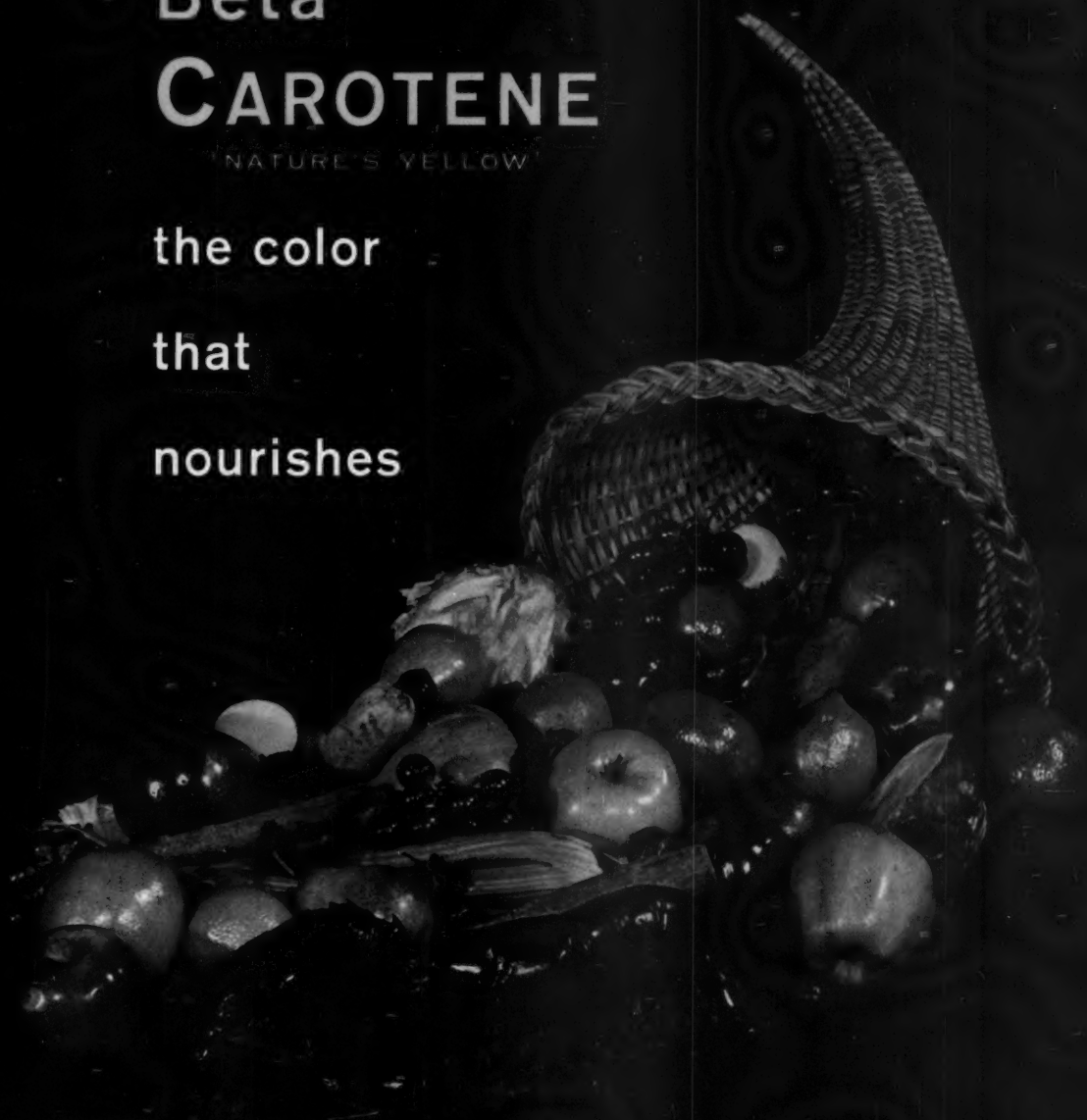
Beta CAROTENE

'NATURE'S YELLOW'

the color

that

nourishes



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Washington Report

Overstuffed packages hit . . . Price issue revived . . . Wet hams force USDA reversal

Deceptive Packaging Drive Gains

FDA finally won higher court support for one of its pet projects: Campaign against misleading packages. Significant development occurred last month when Appeals Court (Phila.) remanded lower court decision and upheld FDA's charges against Delson Candy's thin mints. Government claimed that mints occupied only 44% of container volume, 75% of practical volume. Three previous cases had been tossed out by the courts.

Delson claimed cardboard fillers were necessary to prevent in-transit damage. Court, unanimously, held that "purchasers . . . expected to find more mints than were there." **Commissioner Larick, arguing that "deceptively oversized cartons" are a "rapidly expanding marketing practice," warned that the court ruling "sets a legal precedent for future action in similar cases."**

Warms Old Chestnut: Food Prices

Consumer's food budget is often the favorite whipping boy for politicians. And New Frontiersmen are sticking to the old formula. Witness Atty. Gen. Kennedy's disclosure that alleged price-fixing in meat and milk fields are under scrutiny.

Observers feel that it may be a case of food industry being caught up in some bureaucratic infighting. They point out that the Landis recommendations on regulatory agencies suggested that Justice Dept. concentrate on price fixing, FTC on price discriminations. Hence, they reason, Kennedy may be out to steal a march on FTC (which opposed the Landis proposals) and nail down price fixing as his own bailiwick.

However, grand jury indictments against bakers in Jacksonville and dairy processors in Maryland indicate that bids on food sales to Government will get close going-over by Federal sleuths. Among firms already named: Ward Baking, American Bakeries, National Dairies, Southern Bakeries.

Fats Study Moves Slowly

National Academy of Sciences will move slowly with its new look at fats in foods, may not have report out until next year. Study group, to be named by Food & Nutrition Board, probably will include 7 or 9 academic-type members; none will be directly associated with industry.

The assignment: Is FNB's '58 statement on fats in foods still the last word? Widespread publicity on cholesterol issue means that a review of the '58 stand can't be put off. Some of the scientists, though, would like to duck this hot issue.

How Wet The Ham?

Watered hams are getting almost as big a play as watered stocks used to receive. One of the Eisenhower Administration's last official acts gave Federally-inspected meat packers the right to juice up smoked hams with 10% additional moisture over the original uncured weight. No hearings were held, and USDA slapped a "confidential" stamp on the task force findings.

Deluged by protests from consumer and farm groups, Agriculture Secy. Freeman will reopen the question, has ordered public hearings to be held in Philadelphia April 27; Atlanta May 1; Chicago May 4; Denver May 8; and Portland, Ore., May 11.

Additives Extension Passed

Extending the deadline on additives to June 30, '64, won quick approval in both the House and the Senate. Bill allows FDA to use its own discretion in permitting use of additives now being tested that were in use before Jan. 1, '58.

About 3,000 additives await FDA's yes or no. Workload size makes some feel that the 3-yr. extension may not be enough.

Wage Bill Keeps Food Exemptions

House-passed minimum wage law retains 20-week exemption on overtime for canners and processors, lifts hourly pay floor to $1.15. Administration hopes to win stronger bill in Senate, then have conferees from both Houses recommend the beefed-up version.

No 'Instant Beer' This Summer

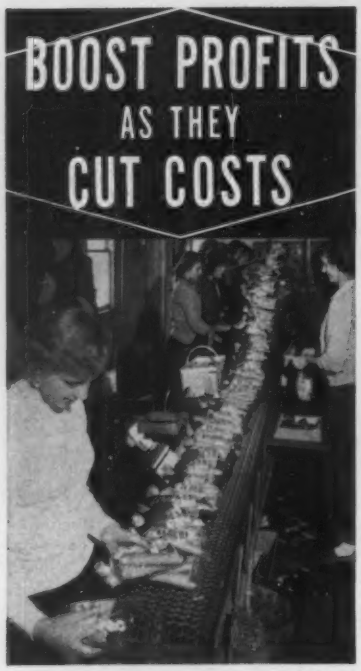
Internal Revenue Service hearings on proposals for "instant beer" will be resumed Sept. 6. Strong opposition by Brewers Assn. of America and Brewery Workers Union to proposal by Union Carbide and Miller Brewing prevailed. Miller says instant product won't be sold directly to consumers.

BRIEFS

Chances for tighter factory inspection law are dim. HEW Secy. Ribicoff is concentrating on guiding education and medical aid bills through Congress, has shunted aside raft of FDA proposals.

Adequate sugar supplies are assured by stop-gap bill that extends present law 21 months, while Congress maps long-range proposal.

(Turn page)



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FLEXIBLE STEEL CONVEYOR BELTS

When used in freezing, canning, or dehydrating . . . on sorting tables, in scalders, washers or cookers . . . for bulk or packaged goods . . . LaPorte Flexible Steel Conveyor Belts give low-cost, worry-free service. The non-corrosive metal is not effected by steam, water or extreme temperatures. Their strong, flexible construction resists stretching and assures a positive drive on the LaPorte Sprocket. They are easily and quickly cleaned and sterilized with steam or scalding water, and no special dressings or belt lacers are needed to keep them in peak condition.

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Washington Report *(Continued)*

USDA proposed revision of U. S. standards for grades of canned green beans and canned waxed beans. Current standards have been in effect since 1953.

Frozen broccoli grade standards are under revision consideration by USDA. Definition of style for short spears would include minimum weight requirements and maximum & minimum length requirements for each unit. Definitions for "detached fragments" and "broken" units have also been proposed.

Procter & Gamble Co. has filed a petition for proposed amendments to regulations affecting standards of identity for mayonnaise, french dressing, and salad dressing, to permit the use of oxystearin as a crystallization inhibitor.

Federal meat inspection regulations are under amendment consideration by USDA. Under proposed rules, no person shall can, salt, cure, render, smoke, or otherwise process any product bearing the inspection legend unless the processing operation is performed at an official establishment. When inspected product is processed elsewhere, inspection marks shall be destroyed. This amendment would make it possible to distinguish meat products processed under Federal inspection from those processed without such inspection.

Amendments to affect lemon handling of fruits grown in Calif. and Ariz., have been recommended, based on evidence received at a public hearing in Los Angeles in October. No action has yet been taken.

FDA Commissioner George P. Larrick, and FDA's Pharmacology director, Dr. Arnold J. Lehman, will lead off the 65th annual national conference of the Assn. of Food & Drug Officials of the U. S. on June 18 at the Hotel Mayflower in Washington, D. C.

Revised cantaloup grade standards will become effective April 15. Important changes provide lower tolerances for defects at shipping point, but higher tolerances en route or at destination.

Frozen speckled butter beans are slated for new grade standards. Described as a relatively new product, they are predicted for commercial importance this year with an estimated 20 million lb expected to be frozen.

Tomato import regulations are under revision consideration. April 1 through July 15 all imports would be limited to U. S. No. 2 or better (2-1/32" minimum diameter) with same regulations in effect for domestic shipments of Texas tomatoes.

FE's Box Score on Key Legislation

BILL	SPONSOR	OBJECTIVE	COMMITTEE
HR 189	Sisk	Authorize federal marketing programs for turkeys, turkey products.	Agriculture
HR 573	Thompson	Set quotas for shrimp imports, duties on excess imports.	Ways & Means
HR 657	Colmer	Impose ad valorem duty of 35% on shrimp imports.	Ways & Means
HR 1106	Ullman	Authorize marketing orders for poultry, potatoes, onions.	Agriculture
HR 2484	Herlong	Require imports, when repackaged, to list country of origin.	Ways & Means
HR 3692	Dent	Apply tariffs to imports to equalize spread between domestic and foreign industries.	Ways & Means
HR 4517	Kastenmeier	Increase special milk program for school children.	Agriculture
HR 4577	Coheland		
HR 4682	Teague	Permit USDA inspection service to cover intrastate meat packing plants when requested by state.	Agriculture
HR 5270	Dingell	Repeal 3c lb. processing tax on coconut oil.	Ways & Means
HR 5583	Miller	Authorize marketing orders on apples used for processing.	Agriculture
S 1122	Williams	Set minimum wage level for agricultural workers at 75¢/hr. in first year, at $1 hr. by third year.	Labor
S 1126	Williams	Require registration of contractors of migrant farm workers.	Labor
S 1128	Williams	Make National Labor Relations Act apply to agriculture.	Labor
S 1129	Williams	Authorize Labor Secy. to set hiring standards for migrant workers.	Labor
S 1260	McGee	Require imported meats, poultry, fish to list origin country.	Labor
S 1321	Fulbright	Permit Navy rations to include margarine or oleo.	Armed Services

		ACTION TAKEN	STATUS
HR 2010	Gathings	Extend use of Mexican workers U. S. farms.	Agriculture subcommittee cut proposed 4-yr. extension to 2 yr. on recommendation of Labor Dept.

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FREEZE DRYING EQUIPMENT

By

Amsco *Del-Vac*

The increasingly vital role of freeze drying in the preservation and concentration of critical substances demands better engineered, more versatile apparatus. Now Amsco Del-Vac Freeze Dry Apparatus fulfills this need within laboratories, pilot plants and production facilities.

Significantly finer performance and versatility of Amsco Del-Vac Freeze Drying equipment permit the direct transfer of process data from laboratory or pilot models to large scale production models . . . without intermediate stages of pilot operation.

Whatever your freeze dry needs . . . whether you require heated, refrigerated process shelves; hydraulic stoppering shelves; a powerful, built-in 5 to 10 micron vaccum pump; or fully automatic controls . . . Amsco Del-Vac has an appropriate model.

Write for fully illustrated brochure IC-606.

Most advanced pilot and light production freeze dryer available . . . Amsco Del-Vac Model 22424RHVM, with heated and refrigerated process shelves, hydraulic stoppering shelves, 5 to 10 micron vacuum pump . . . The ultimate in freeze dry efficiency.

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new packages & products

OLD AND NEW SANKA

NEW SCHLITZ DESIGN

MULTI-PACK CLIP

FOLDING CARTON WINNERS IN FOOD

BEVERAGE BASE IN 'CUBITAINER'

MODERN DESIGN DEBUTS NEW SANKA

New blend of Instant Sanka coffee, dressed up in a re-designed package and backed up by $2 million of advertising, is being debuted by General Foods.

Premium blend of six different coffees and the latest technological improvements in caffein removal and coffee roasting are represented in the new Sanka, according to GF's Maxwell House Div.

Design switch, by Lippincott & Margulies (311), was initiated to help change image of a coffee substitute to a full-flavored coffee brand and also to broaden customer base to all age groups.

SCHLITZ BREWS NEW LABEL ATTIRE

First significant change in Schlitz labeling in a generation is designed to "incorporate modern trends in product identification and to strengthen firm's emphasis on label as an important marketing tool."

Principal changes are much more lavish use of white space for an uncluttered appearance; simplified and centralized Schlitz globe framed with scroll lines; and a more modern script for familiar Schlitz slogan.

PLASTIC CLIP FOR MULTI-PACKS

Novel plastic clip for multi-packs has passed its first test with "good consumer acceptance." Arizona Brewing Co., using the "Phantom-Pack" clip for A-1 Premium Beer distributed through Southern California's Food Giant chain, also reports an economical 600 cpm. packaging line operation.

Clips weigh less than standard overwraps, cost less to handle, require less storage space, and provide maximum brand visibility. Straight-line multi-packer unit for

applying clips is fully automatic, designed for low maintenance and flexible operation. Tay-Pak Corp., San Francisco, supplies clips and machinery. (312)

FOOD CARTONS TAKE THREE FIRST AWARDS

Three food packages received first awards in the '61 Folding Carton Competition sponsored by the Folding Paper Box Assn. of America. Nine others received merit awards.

Twinkles cereal from General Mills had a first in general merchandising superiority and also a merit award for potential new volume use. Boxmaker: Waldorf Paper Products Co., St. Paul, Minn. (313)

Harbor House shrimp products from Salada-Shirriff-Horsey also received a general merchandising superiority first for attractive color photography "with a difference." Boxmaker: Milprint, Inc., Milwaukee. (314)

Stop & Shop ¼-lb. Margarine from Miami Margarine Co., Cincinnati, designed specifically for vending machines, achieved a potential new volume first. Boxmaker: The Richardson Taylor-Globe Corp., Cincinnati. (315)

SHIP BEVERAGE BASE IN POLY 'CUBITAINER'

Squirt Co. bottlers will soon be receiving their supplies of beverage base in an unusual new container.

It's a cubical package made of heavy gage polyethylene, which comes to the bottler hermetically sealed, protected by a special double carton with an easy-opening pull strip. Lift the tab, pull, and the top is neatly removed.

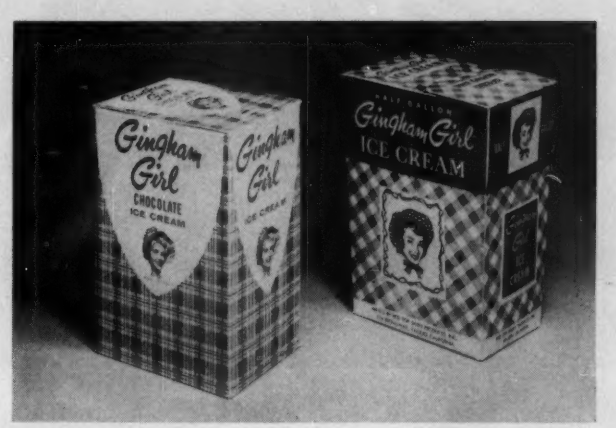
Light-weight, 5-gal. container was developed for The Squirt Co. in a combined operation of the International Paper Co. (316) and the Hedwin Corp. (317), originator of the polyethylene "Cubitainer."

SLIP-ON HOOD FOR 'READY DIET'

Dual-purpose carton hood for Borden's new 900 calorie "Ready Diet" weight control drink provides immediate product identification and serves as a receptacle for an instructional diet booklet.

Through the use of two different die-cut side panels, slip-on bottomless hood fits over both Borden's steeple and flat type containers, giving both cartons a uniform appearance and a "Golden Look." Folding Carton Dept. of Riegel Paper Corp. (318) produces and prints the hood.

'READY DIET' HOOD



AT LEFT—THAT 'SLIM LOOK'

WHITE SAUCE MIX

'SLIM LOOK' FOR GINGHAM GIRL

Photographic art, three-color printing, and slimmer lines feature new carton adopted by Red Top Dairy Products, Inc., Vallejo, Calif., for its Gingham Girl ice cream.

New package design, produced and developed at Santa Clara plant of Container Corp. of America (319), squares plaid pattern and stresses vertical lines for the slim look. Use of brand name and Gingham Girl picture on four sides provides maximum identification.

Carton also represents a switch to automatic end from pail design formerly used.

MARKET LOW CALORIE INSTANT WHITE SAUCE

New for weight-watchers is Hi-Health Instant White Sauce, a Low Calorie Mix which needs only boiling water to prepare. Introduced by Prospect Enterprises, Inc., Stamford, N. Y., tablespoon of product contains only 9 calories.

Attractive four-color carton is

For more data, circle item numbers on Inquiry Card, back of book

Seabrook Farms Cooks Delicious Meat Balls In 10 Minutes With A Fostoria Infrared Oven

Seabrook Farms, of Seabrook, N. J., speeds processing and improves the quality of quick-frozen meat balls with a Fostoria Infrared oven. Just 10 minutes are required to turn out meat balls with "firm crust, excellent color, juicy interior and good texture."

Dozens of other food processors have found that Infrared ovens cook faster than any other method and can easily be controlled to heat or cook at any desired speed. Fostoria Infrared cooking is cleaner than other non-electric methods . . . does not require oven preheating . . . costs less and occupies less floor space than conventional ovens.

Foods cooked by Fostoria Infrared ovens retain more moisture . . . yet will not absorb fat as with deep-fat frying or braising. A growing number of food processors are using this efficient, modern technique to cook or partially cook fish, meat, vegetables and chicken prior to freezing.

Write for "Radiant Heat – Applications Unlimited", Infrared Division, Fostoria Corporation, Fostoria, Ohio.

FOSTORIA

printed by Lord Baltimore Press (320) on .014 caliper virgin fibre IPX board from International Paper Co. (321). Hand-loaded and featuring Anchor-Tuck construction, package's front panel has an appetizing, realistic close-up photograph of a dinner plate.

PLASTIC-COATED wax-free carton is being used for new "Dairy-Pure" Chilled Orange Juice from Minute Maid Co. Carton, from Sealright Co., Fulton, N. Y. (322), eliminates wax-flaking and minimizes leakage.

New Product Shorts

Amandel cookies and Scooter Pies from Burry Biscuit Corp., are now available for the vending machine market.

Fresh frozen baked goods, including Pecan Coffee Rings, Cinnamon Coffee Cakes, and a variety of pies and pastries, are being tested in Rochester, N. Y. market by Fanny Farmer, makers of Famous Candies.

Packaging Briefs

Adapta-Pak, a top-loaded, wrapperless, sealed carton for frozen vegetables, made its debut at the Dallas convention of the Nat'l Assn. of Frozen Food Packers. Carton, from Container Corp. of America, adapts to existing Kliklok lines and to manual or machine loading. (323)

Hav-A-Tray containers, thin walled, reinforced plastic trays suitable for frozen food packaging, have been introduced by Hav-A-Tray Div. of Haveg Industries, Taunton, Mass. (324)

Celcon, a new high-strength plastic from Celanese Corp. of America, can be blow-molded for a variety of containers, including aerosols. (325)

"Waterbuff," a specially treated grocery sack that resists the weakening effect of water and water vapor, has been announced by Packaging Div. of Olin Mathieson Chemical Corp. (326)

CIRCLE 26 ON INQUIRY CARD

CIRCLE 27 ON INQUIRY CARD ➔

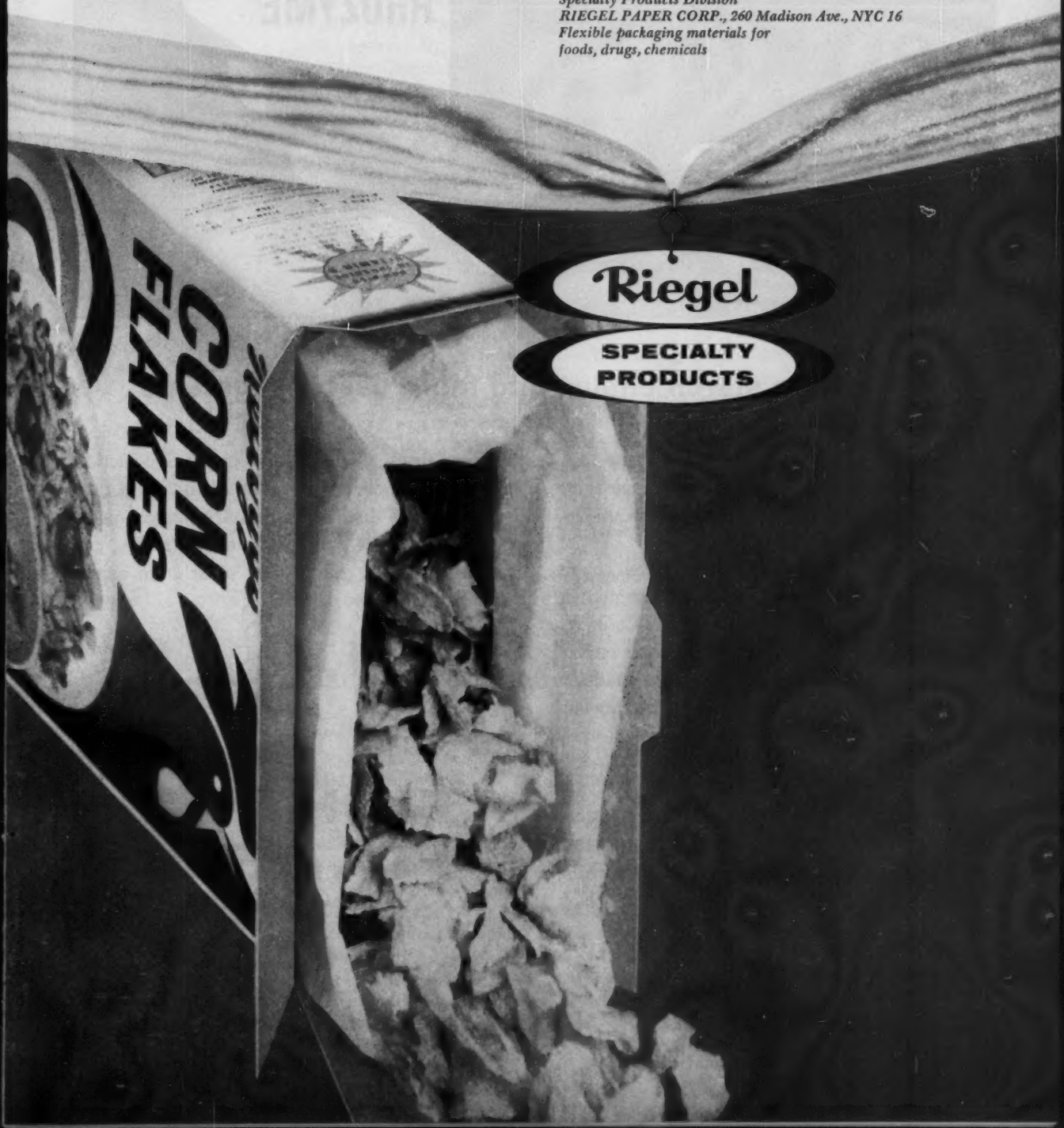
Riegel carton liners protect the crisp goodness in Kellogg's cereals

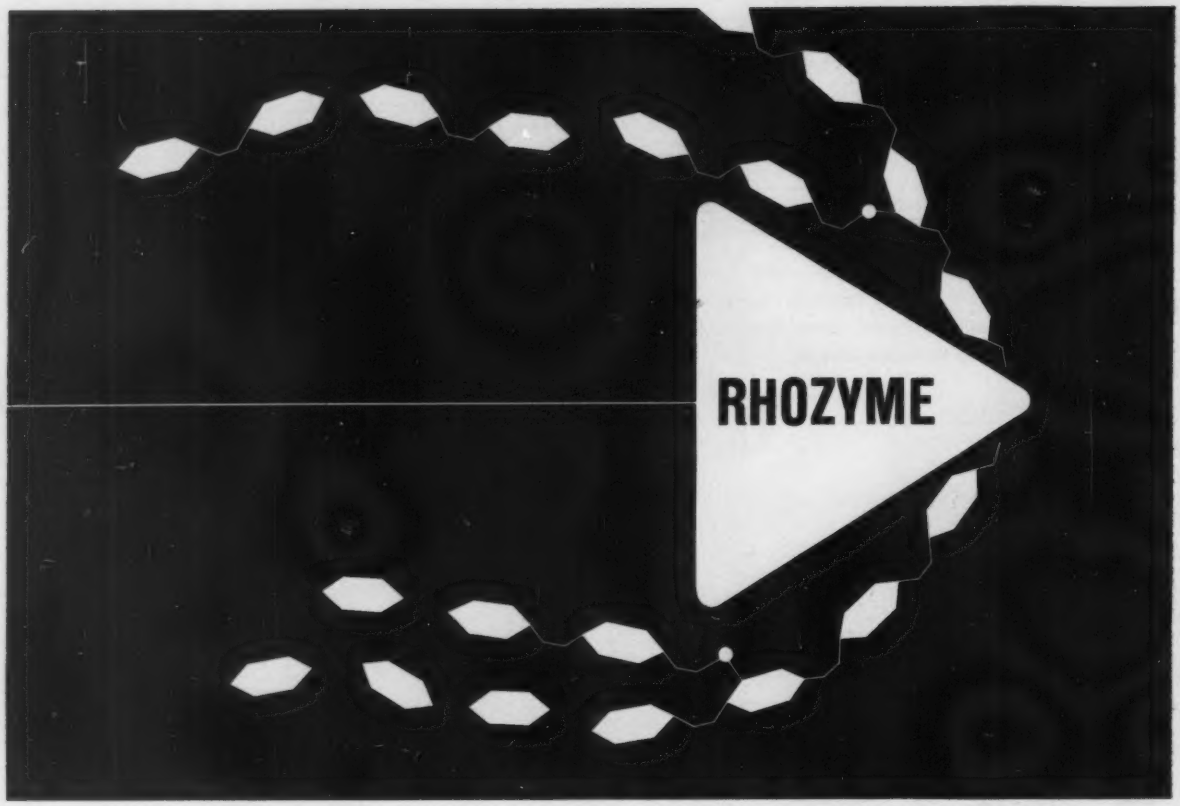
Riegel, a volume producer of carton liner material, tailors its papers to meet Kellogg's specific protection needs.

Customer loyalty is a valuable asset . . . and the people who guide Kellogg's protect theirs carefully. One custodian of this loyalty is the special Riegel carton liner that maintains the crisp goodness of Kellogg's cereals.

We've a flair for thinking of your product as something special, too, and developing for it the one best answer, be it pouch paper, glassine, foil, film, or combination . . . printed, coated or plain. Write for more information today . . . for the new ideas come from Riegel.

Specialty Products Division
RIEGEL PAPER CORP., 260 Madison Ave., NYC 16
Flexible packaging materials for foods, drugs, chemicals





Breaks up starch chains into more useful segments

Rohm & Haas offers a variety of RHOZYME® diastatic enzymes which can give you the saccharifying or liquefying action you need in processing starches.

Certain grades of RHOZYME convert starch chains to simple sugars—for applications requiring either sweetening or the presence of fermentable or reducing sugars. Other grades break up starch mostly into dextrins with minimal increase in reducing groups, to provide controlled degrees of liquefaction. Rigid starch gels can be given viscosity levels ranging from thick slurries to free-flowing liquids.

Applications of RHOZYME diastatic enzymes include: breadmaking; pharmaceutical uses; processing of chocolate sirups, pre-cooked cereals; production of acid-enzyme converted sirups, high maltose sirups, high glucose sirups; liquefaction and saccharification of grain, corn, or potato starch for the distillation industry; starch modification for paper coatings, laundry starches, adhesives, textiles; recovery of sugar from candy scrap; starch waste disposal.

Write Dept. SP-23 for technical literature and samples of RHOZYME enzymes.

ROHM & HAAS

PHILADELPHIA 5, PA.

RHOZYME

Time for Food Firms To Face Full Responsibility

Russia is far outstripping us in training food technologists.

So observes Dr. Harold Schultz, IFT's president-elect and head of Food and Dairy Technology, Oregon State.

Russia's advantage, in fact, is estimated at 50 to 1.

Soviet institutes reportedly produce 2,500 food technologists annually. We graduate about 50. We need 400. Only 256 undergraduates were training in the U.S. last year.

Technology is a prime mover in progress. And in the opinion of IFT's president-elect, we need two to four times as many food technologists as we have to meet international competition.

Certainly we need that many and more to stay ahead of Russia in the long pull. And stay ahead we must.

But more. Our food industry must keep our nation the healthiest, the most energetic—as pointed up by Chairman Mortimer of General Foods. That is vital in cold wars and hot.

Whose fault is it that we don't produce enough technologists? It is largely the fault of food manufacturers.

Many universities and colleges have tried hard. But food companies, with very few exceptions, have not done their share.

It's time all food manufacturers worth the patronage of America's citizens realize their full responsibility to Americans. Certainly it is up to food firms to keep the U.S. out front in food and nutrition.

To do this they need more technical manpower in the future. To get that technical help they should actively interest youngsters in good technology, aid students with scholarships, and stimulate the profession of food technology by good pay and opportunity.

There is more to the future of free enterprise than profit.

Industry Takes Additives Ball From FDA

Refreshing new approach to the problem of food additives.

That's how Food Law Institute's President Franklin M. Depew characterizes the GRAS list of flavors prepared by Flavoring Extract Manufacturers Assn. (page 93).

Here, too, is a significant demonstration of what our industry can and should do for itself. Here is exemplary action in self-policing. Here is a fine case-history of keeping government out of industry via self-solution of problems.

There reportedly are 3,000 additives yet to be cleared. To get that tremendous job done, industry must take a hand.

Status of FEMA's list is not contingent upon FDA approval. The law only requires general recognition by qualified experts.

FDA should concur with FEMA. But the flavors listed by FEMA are GRAS under the law, no matter what FDA does.

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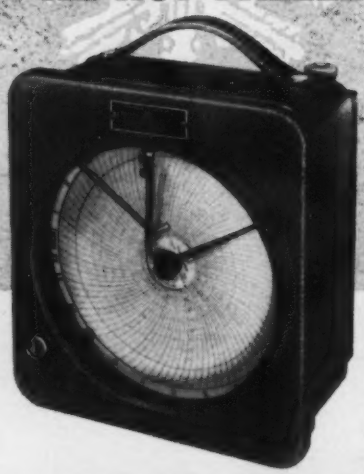
WILL NOT FREEZE



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FOOD ENGINEERING

KHRUSHCHEV IN CORN field of Iowa, with Roswell Garst, who is shouting at photographers. Corn so impressed Mr. K that he stepped up corn canning goals in Russia. (World Wide Photo.)

Inside Russia's Food Plants

Dynamic expansion keys progress. Irradiation, antibiotics and freeze-drying advances underway. Other innovations mixed with antiquated operations

DYNAMIC EXPANSION is taking place in Russia's food manufacturing and processing industry. And this trend will continue for quite some time.

Russia rapidly is increasing the supply of fruits and vegetables. Everywhere you go you see new plantings of fruit trees. Here is a threat to the West because of potential exports to European markets.

Every plant visited by a team of U. S. food men had a new wing, or a new building.

Still, it would take decades for the Soviet to reach our capacity—even if we stood still. Convenience foods are far short of our achievements. Baby food production began only 5 years ago. Meat is woefully short, and a feed shortage is slowing improvement.

Quick freezing is just barely getting underway. Russia still has to build a cold chain, and there are only 2,000,000 domestic refrigerators.

Russian food factories are weak in quality control. Standards are very scarce. Additives are regulated by the Home Ministry of Health. Like some other European authorities, those in Russia are opposed to food chemicals.

Packaging is far behind our practices. And there is a serious shortage of packaging materials.

G. E. HILBERT
Director, Foreign Research & Technical Programs Div., USDA Agricultural Research Service, Washington, D. C.

Team Visits Soviet

Dr. G. E. Hilbert led a team of American food men on a one-month tour of food plants and research institutions in Russia. Among members of team was Milan D. Smith, then President of National Canners Assn. and author of canning section of this article.

There are no self-service food stores. Vending machines are starting to come in, but mostly for fruit juice beverages.

Carbohydrates make up 80% of the Russian diet. Protein is in short supply.

Ninety to 95% of the equipment seen in Russian food plants was the kind used in the U. S. 20 to 30 years ago. But the plants are starting to install modern equipment.

Food factories must make a good profit in the Soviet, or the director is fired. Some of the profit goes to the government, part is for bonuses, and the remainder is spent for plant expansion and modernization.

Can the Russian food factory worker afford to buy the products he helps to produce? Consider some figures: Wages are $40 to $50 a month for unskilled labor.

Big part of the diet is bread. Rye bread costs 15¢/lb; wheat bread, 25¢. One pound of sugar takes 45¢ of a worker's meager wages. Hamburger costs $1.50/lb.

Russians work a 45-hr. week. And it takes nearly 2 hr. to earn a pound of sugar; 6 hr. for 1 lb. of hamburger. Obviously the worker has a hard time paying for an existence. Of course his wife also works. But even then eating as we know it is out of reach.

Fortunately for the Russians, medicine and rent cost practically nothing.

Score on Exotic Processes

Freeze Drying — Russia has a pilot plant for freeze-drying meat. The product looks like dried hamburger.

Soviet technologists have much to learn about dehydration. Dried chicken in soup, to take an example, is very poor quality.

Yet we saw many dehydrated products in stores. One is sliced whole apples—so discolored as to look like dates. Another, dried prunes, does not taste like ours, and the prunes are small. It would appear that these products are air dried in open trays.

Irradiation—Potatoes are being irradiated in a large experimental plant. The treated potatoes can be stored one or two years without sprouting. Irradiated with a light dose of 6,000 to 7,000 rad., the potatoes are sold for consumption.

Much basic research is being done on irradiation, and Russia is about where we are in respect to progress.

Antibiotics—Fish sometimes is treated with antibiotics to preserve quality longer. And antibiotics are being added experimentally to canned goods to cut process time. Tests also are being made on poultry and meat.

Biggest Food Factory

One of Russias biggest food plants is the Mikoyan. It produces about 200 different items, and probably is the only plant making convenience foods. With so many products, the efficiency of specialized lines cannot be attained.

Cake and biscuit mixes, dehydrated pea soup, mixed dehydrated fruits, and dried baby foods are among the Mikoyan items. One baby food is oatmeal, sometimes with raisins added. Baby foods in glass are produced, too. There are about 30 kinds, many with a cereal base. And there are soups and homogenized ground liver.

The Mikoyan factory produces buckwheat products in large volume. The grain is pearled and mixed with dehydrated meat, then packaged. It makes almost a complete meal when boiled or fried. But a sample tasted by the author was rancid. High in fat content, it doesn't keep well.

Compressed food bars are another unusual Mikoyan item. These may be made of fruit, or be composed of grain (perhaps oatmeal), dried onions and dehydrated beef. Mixed with water, the bars make gruel or soup. And one gets the impression that a large part of the Mikoyan plant's production goes to the armed forces and isolated areas.

Pudding mix production also is large in this factory. Corn starch is combined with roller dried fruit juice powders — strawberry, for example.

Tasteless, tough cornflakes are made at Mikoyan, a product that puzzles Russians familiar with the excellent American product. Puffed corn and wheat and poor quality popcorn are other items. This plant produces shelled popcorn for all of Russia.

Inferior packaging materials are used in this plant. Cornflakes, for example, go into one of the poorest grades of cardboard we have seen. Nor is there a liner to keep the flakes fresh and crisp.

Effective product and package development work is not a part of the Russian picture. But be that as it may, the Soviet is making a tremendous drive to up the consumption of corn as food and to get more platable products in the diet.

The impression Iowa's corn fields made on Mr. K. has been translated into a practical food goal.

New Nut in Soviet

Immature green English walnuts are harvested before the outer hull hardens. These are steeped in lime water to soften the outer skin, which is removed. The skinned product is pasteurized at about 105C. in sugar syrup, and packaged in glass jars.

After processing, the walnut is black, soft and sweet. Its flavor is quite bland.

Diet Rich in Cost Only

Soviet diet is estimated at less than 3,000 calories a day. This breaks down to 56% supplied by grains and potatoes, 15% by animal protein foods, 10% by fats and oils, and nearly 10% by sugar. The diet also includes substantial quantities of vegetables, but consumption of fruits is low.

In Moscow in '59, the average Russian workman with family of four spent 62% of a 46-hr. work week to earn an adequate supply of seven essential foods (bread, potatoes, beef, eggs, milk, butter, sugar).—Richard E. Bell, Foreign Agricultural Service, USDA.

The Unique—Branch by Branch

Fisheries — Serious need for more protein in the diet puts high priority on progress in fishery operations. That's why Russia is perhaps ahead of use in this area.

Soviet fishermen operate some 200 refrigerated boats, most of them modern. Fish are quickly

frozen aboard the boats and glazed with ice to prevent desiccation. When the ships reach port, their cargoes go by rail to a central point for thawing. Then the fish either are sold fresh or canned.

Baking—There are no less than 400 continuous bread dough operations in the Soviet. We have but a small fraction of that number.

But beyond that, what? Bakers deliver to stores 6 to 10 times a day to insure a fresh supply of bread. Obviously there is no stale bread return problem.

None of the bread is wrapped, for Russia is short of all packaged materials.

Flour is not bleached, although an oxidizer is added to dough. Bread is not enriched. Vitamins, Russia believes, should come primarily from natural sources. So, high-extraction flour (85 to 90%) is used in bread for better nutrient content. Russian bakers make many dark breads.

Beet Sugar Refining—Rapid expansion is taking place in the beet sugar industry—for good reason. Russia's per capita consumption of sugar is only 75 lb. annually, compared to 120 in the U. S. The plan is to double output by '65.

Sugar refineries are modern. And the plants are using a new technique to extend the operating season considerably. Beets are stored 10-ft. deep in V-shape trenches in the earth, covered with soil. This storage and the cold climate permit plants to operate 5 or 6 months a year, or twice as long as before.

Bottling Beverages—Formulated drinks like Coca-Cola and artificially flavored beverages are not favored by Soviet food policy. Russia is pushing fruit-juice drinks, like strawberry soda. This soda is depectinized strawberry juice with citric acid and sugar added. There are many different bottled drinks, including apple, pear, apricot and grape. They are fine beverages.

RUSSIAN CHERRIES and preserved walnuts packed in glass. Latter is unique.

All are not bottled, however. Along the streets you see girls selling fruit drinks from large cylinders, or barrels. The beverage is dispensed into a graduated glass and carbonated water is added. A street vendor has but one glass. It is rinsed over a water jet between uses. Automatic coin machines also vend these drinks, which are quite popular. It is common to see a beverage queue of 5 to 15 people.

Bottled fruit drinks are carbonated, but not as heavily as ours. And Russia does have one synthetic beverage. It contains considerable coumarin, an additive banned because of toxicity in the U. S.

Dairy Plants—A dairy research institute supplies technical information to a dairy plant design institute, a tremendous organization. The latter designs all of milk plants, being paid by the city or state for which the plant is designed. The institutes produce modern plants, but with inefficient layouts. And receiving platforms for large cans of milk are higher than the floor of the trucks.

About 40% of the milk is consumed as fermented products, like yogurt. These keep better without refrigeration, and Russians have acquired a taste for them. Fermented mare's milk, koumiss, is a delicacy in Siberia.

In some areas, such as the far eastern part, there are no milk cows. So dried milk is consumed there. It contains the proper fermentation bacteria to produce yogurt—or "instant yogurt." An advantage here is that off-flavor is masked by the strong taste of the fermented product.

Russia has developed many ways to use cottage cheese. Usually eaten in a sweetened form, the cheese has added flavor, such as vanilla—or other ingredients, like raisins. Additives make it attractive to children. Even cottage cheese cakes for wedding parties are popular.

Visiting Americans praise Russian ice cream. Like most things, this is made to government specifications. In this case, the specs happen to be right. Ice cream cakes

50 Technologists to Our 1

Russian science institutes are reportedly graduating 2,500 food technologists or their equivalent every year.

By contrast, U. S. universities are graduating only about 50 a year. Yet the minimum need is 400.—Harold Schultz, Head of Dept. of Food & Dairy Technology, Oregon State College, and IFT president-elect.

Who Invented Canning???

According to recent claims, Vasilii Nazarevich Karazin invented canning and presented his great achievement to the Russian government in 1806—four years before Appert's invention.

Needless to say, there are many suspicious resemblances to the Appert story.

AMONG RUSSIA'S LARGEST fruit and vegetable operations is First of May canning and freezing plant at Tiraspol. (Photo by Milan D. Smith, author of article on canning in Russia, next issue of FE.)

and cones are manufactured, too.

Milk is filled into ½- and 1-pint bottles (no quarts) at a rate of about 60 per min.—a packaging speed commonly found in Russian food plants. Packaging lines, however, have three to five times as many workers as in the U. S. Why? The machines do not function properly.

Some dairies enrich milk with vitamins, particularly C.

Meat Packing — Three meat plants visited not only are comparable to U. S. plants, but have interesting innovations. And they handle 6,000 to 15,000 animals daily.

Animals are stunned electrically, but with some difficulty. Voltage comes from charged plates over which the animals are maneuvered. But the beasts frequently slip and fall on the smooth plates. Then they have to be stunned by an electrical stick.

Mechanical hide strippers, not seen in American plants, speed operations in the Mikoyan meat plant in Moscow. Stationary hooks in either side of the split hide strip the carcass as it is moved by powerful conveyor. With sheep, hooks are inserted into eyes in a rotating drum to pull off the hide. Men with knives stand ready to assist the mechanical skinners, so the man-hour economy is nothing to brag about.

Would the skinning devices work in American plants? This is questionable. Russian animals are skinny, where ours are fat. From 90 to 95% of beef critters would grade as "canners" or "cutters" by our standards. They are worn out milk cows and surplus young bulls—no steers. Averaging about 500 lb., or half the weight of American animals, the beef are underfed and scrubby looking.

What's more, baby water buffalo are intermingled with the cows. And goats with the sheep.

Russia has another innovation in meat packing. Animals are bled aseptically to obtain blood for therapeutic purposes and to make blood sausage. A hollow 6-ft. knife is plunged into the heart of a stunned animal. Through this tool, two buckets of blood from a beef animal is pulled by vacuum into a pail.

Only 50% of the beef is sold fresh. Practically no fresh meat is seen in retail stores, but restaurants have plenty.

Sausage, heavily spiced to keep without refrigeration, is a principal meat item. It is high in fat content, too. The people need fat.

Frankfurters and bologna also are produced. These sell at about 75¢/lb. compared to $1.50 for "hard" or dry sausage. Another item is hamburger—light pink in color, about 50% fat and priced at $1.50/lb.

Drugs are an important meat plant product in Russia. In two of the three plants visited, insulin and adrenalin were extracted from hormone glands. Tonic for women and children is made from blood. Most unique, however, is the "blood candy" or medical candy. In addition to blood, it contains sugar and chocolate or vanilla—for the kids. Incidentally, drugs sell for practically nothing in Russia, being subsidized by food in the case of insulin.

The meat plant drug operation is about the size of a U. S. pilot plant. That this system is inefficient is obvious. Few American meat plants can afford to make drugs.

Artificial flowers from dyed and shaped poultry feathers. Birds and the like carved from bones by hand. These are two meat industry products U. S. packers wouldn't touch. Too much labor. In Russia, labor is cheap and plentiful.

Nine of ten meat plant workers are women. But men do the heaviest work—slaughter and skinning.

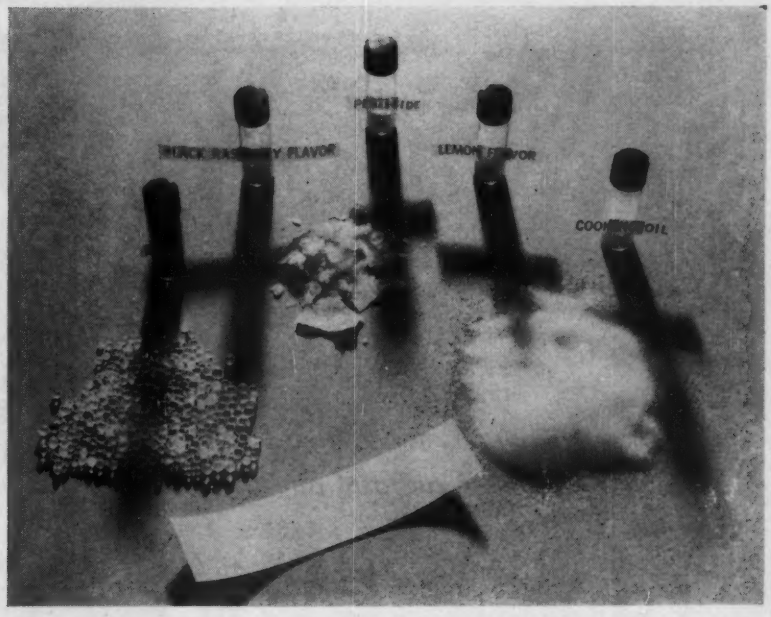
Wine, Tea—A cognac plant visited was much like ours except that bottling was semi-manual. A tea plant resembles a 40-year-old American operation. Yet quality is controlled by tea tasters and the blend is good. Packaging is semi-mechanical. (End)

Backwoods Sanitation

While plant and equipment sanitation in general is good, personnel sanitation is terribly poor. Toilet facilities usually are of the out-door variety — and most inadequate at that. In one big plant employing hundreds, there is no place where workers can wash their hands. Yet in Odessa, a baby foods plant managed by a woman has shower facilities.

Canning Article Coming

Significant information on advances and shortcomings of canning branch of food industry in Russia is coming in next issue of FOOD Engineering.—The Editors.



TENDER TRAP for elusive flavor components, oxygen-sensitive ingredients, or dangerous pesticides is formed by microencapsulation. Versatility in size and form of minute capsules is seen here.

Micro-Packages Feasible in Tests

Capsules as small as 0.025 in. can entrap volatile flavors and aromas—or keep ingredients separated—until food is used

TINY CAPSULES — as small as 0.025 in.—can give much of the protection of tinplate and film packages. And these have been investigated to determine their potential in food processing.

Microencapsulation originally was developed by the National Cash Register Company. NCR encapsulated a dye in a polymer film. The dye was colorless until it was introduced to a reagent. NCR coated paper treated with the reagent with microcapsules containing the colorless dye. Under pressure of typing or writing, the capsules broke. The result was copies without carbon paper.

National Cash Register retained Stanford Research Institute of Menlo Park, Calif., to explore the microencapsulation technique. SRI conducted studies to find what materials lent themselves to encapsulation, how the coating could be varied, how the microcapsules could be ruptured to release their contents, and how they could be put to practical use.

GODFREY LEHMAN
California Correspondent, FOOD Engineering

Will Retain Flavor

The scientists find that microencapsulation can give foods extra shelf-life. Possible uses in the food industry include the field of prepared mixes. Highly volatile substances used to give the mixes flavor and aroma can be encapsulated before addition to the mix. The coating can be engineered to dissolve when water is added. Thus the flavor may be protected until needed, and released in all its strength.

SRI believes that encapsulation can be used by makers of mixes for beverages, cakes, and other foods. It may be employed to preserve perishable nutrients in foods. And it can be applied to a wide variety of solids and liquids.

Tests are continuing to determine whether gases may be encapsulated under pressure.

The capsule wall can be varied as to material, strength, permeability, and additives. The wall can contain additional substances which will react with the contents when they are released. And the capsule can be tailored to break down under heat, pressure, grinding, dissolving, or enzymatic action.

Applicable to Liquids

Encapsulation permits liquids to be handled like solids. The capsules can be made in varying sizes and be produced in dry, granular form, or as aggregates in a plastic mass. They may be mixed with liquid, solid, or semi-solid materials. They may even be used as a coating on paper or other substances.

Basic research at SBI, therefore, is revealing encapsulation to be a versatile process with many obvious applications in the food industry. Besides its uses in the packaging of the finished product, capsulation can be employed in the plant for storage of materials that must be protected from oxidation, moisture, or sunlight.

Acids, detergents, disinfectants, and descalants could be handled with safety and would also be protected from evaporation or decomposition if encapsulated. (End)

Want a $4 billion market that's expanding faster than total population? . . . Here are straight tips on product types and selling strategies that show you . . .

How To Cash In on a Growth Market

NEGRO MARKET of 19 million people with purchasing power exceeding $20-billion can mean increased sales and profit.

Knowledge of the market—characteristics, food expenditures and consumption, purchasing patterns —must be known if you want to reach this increasingly important volume target.

Two significant things are happening to the Negro. First, he is migrating from the South (where only 52% of Negroes still live) to urban areas in the North and West. Secondly, he is increasing at a 50% faster rate than his fellow Americans.

More than 40% of the Negro population is located in the top 40 of the nation's markets. And this 40% earns an estimated 65% of total Negro income.

As a result of this migration, many cities have Negro populations far above the national 10% ratio. For example: New York, Negroes represent 14% of the population; Chicago, 23%; Philadelphia, 26%; Detroit, 29%; Baltimore, 35%; Cleveland, 29%; Washington, D. C., 54%; Memphis, 37%, and Atlanta, 38%.

Predicts Julius A. Thomas, industrial relations director, National Urban League: If this migration rate continues, in 10 years, eight or nine major cities will have Negro populations in excess of 50% of the total.

Faster population growth rate is no less phenomenal than the even more rapid rate at which Negro family formations are taking place. It is a younger population—median age of 23.4 vs. 30.2 for white. There is a higher percentage under the age of 24, especially in the under-10 category.

$4 Billion Market

Today, urban Negro families spend approximately $4 billion for food annually. Food, as with the general population, is the biggest budget item.

Median income for urban Negro families is said to be $3500; in large cities it tops $4000. In these urban markets some 42% of Negro wives are working, adding substantially to family income. These wives' earnings have helped Negro personal income, after taxes, to jump some 58% since 1950.

D. PARKE GIBSON,
D. Parke Gibson Public Relations, New York City

Although white families spend proportionately more of total income for food than comparable-income Negro families, a considerable part of their food dollars goes for food consumed *outside* the home (in restaurants, for example).

Negro families, however, consistently spend more than comparable-income white families for food purchased at the grocery and consumed at home. Market Research Corp. of America figures that the Northern Negro family spends 12% more on food than its white counterpart, the Southern Negro unit 7% more. These differences should serve as a base for food manufacturers in giving consideration to the Negro market.

Management must remember this very important fact: In certain product classes, Negro families tend to spend more than white families in the same income group.

According to USDA, urban Negroes in the $4000 wage bracket spend 9% more for soft drinks and fruit ades than do comparable-income white families. Compared to white households, Negro units in the over $2000 income range spend less for commercially canned vegetables, and those earning under $2000 spend 19% more. In frozen vegetables, urban Negro families in the $2000-$4000 range spend 4% more, and in the $4000 and over bracket, 26% more.

On almost all income levels, a much greater percentage of Negro families (around 60% more) buy processed milk and spend considerably more per family. This is probably because of the greater proportion of children under 10.

As Negro families climb the income ladder, they shift from canned to frozen foods.

According to MRCA's Vice Pres. Don W. Connell, amount of canned spaghetti with meat bought per urban Negro family is 55% greater than the per white family purchases. Same percentage of Negro families buy canned peas as white families, but they consume 22% more. Almost three times as many Negro families buy regular packaged rice as do white families, and the amount purchased is three times as much. Furthermore, while the same percentage of each race buys the more expensive precooked packaged product, Negro purchase rate is 28% greater.

Negro families do not buy TV dinners as much as white families. A smaller percentage of Negro families buy frozen dessert pies, but uses about one-third more.

The generalization that buyers of convenience items tend to be in the upper income categories, says Connell, does not always hold true for Negro families, as the Negro consumption of frozen vegetables and pre-cooked rice would indicate.

A preference study by radio station WDIA, Memphis, showed that Negroes, representing only 40% of population, bought 80% of the rice, 60% of the flour sold there.

Although the Negro tends to overspend in some product categories, he underspends in others. Clarence Holte, head of Batten, Barton, Durstine & Osborn's Ethnic Marketing Division, cites cereals as one category. He points out that LIFE Magazine's Survey of Consumer Expenditures shows white purchasing of cereals at $8.90, Negro at $5.80. According to Holte, "Negroes have not been motivated to buy more cereals,

Here's a Handy Check-List For Increasing Sales to Negro Market

- ✓ Get a fix on the potential market, then keep current with shifting population and rising economic standards. At least once a year, have Negro media rep brief your marketing staff.
- ✓ In weighing Negro's needs and desires, avoid stereotypes or hearsay opinions. Know the difference between segregation . . . and good public relations.
- ✓ Keep tabs on what competition is doing—competing brands or services that are being developed, type of supporting advertising and merchandising being used.
- ✓ Determine how much must be spent, which media to use, amount allocated for in each medium.
- ✓ Check to see if ad copy should be tailored for the market.
- ✓ Give specialized advertising and promotional support to dealers and distributors where it will count.
- ✓ Keep Negro market and/or brand studies up-to-date, review periodically.
- ✓ Use specialized counsel where such help is required.
- ✓ Employ, when possible, Negro salesmen, home economists, and demonstrators for effective dealer and consumer relations.
- ✓ Establish corporate representation, through staff, employees or counsel at Negro marketing clinics, conventions, home-service shows, and consumer clinics, to generate good will, establish a base for increased consumer acceptance.

Family Spending For Food Consumed at Home

Income Range	White	Negro	Bigger Outlay By Negroes
$1,000—$2,000	$ 483	$ 515	+7%
$2,000—$3,000	747	766	+2%
$6,000—$7,000	1,253	1,332	+6%
$7,500—$10,000	1,405	1,580	+12%

Source: Univ. of Penna. '56 Consumer Expenditures Survey

and the figures are indicative that the 'mass' media concept is not as effective among Negro families as among white."

"Food marketers," Holte emphasizes, "need to conduct programs aimed at Negro consumers. To increase sales and profits, a company has to make a direct appeal."

He cites confections, nuts, and cheese as other categories where manufacturers are losing sales and profits by not directing specific appeals to Negro buyers.

What Should You Do?

How does a company go about sharpening its sales efforts in the Negro market? BBDO is trying to get some answers, through Holte's division, for a client.

In this case the New York City market is being viewed as a whole with the Negro market as a vital component. (It is important to point out that with BBDO Holte holds a position in advertising such as no other agency has accorded a Negro, and his duties are no longer restricted to Negroes specifically but cover all ethnic groups.)

Holte, and BBDO, are approaching the problem scientifically by breaking New York City down into major ethnic groups. Once this breakdown of the Jewish, Puerto Rican, Italian, and Negro population is complete, a marketer will be able to check sales in retail outlets in each neighborhood, and determine where the sales lag can be corrected. When this is done, he can approach the particular market through a direct campaign. It could be the Negro market, as was the case in Chicago when General Mills was facing a sales problem for Gold Medal flour.

According to EBONY Magazine, GM's brand was being outsold by a competitive flour three to one. Representatives from the magazine worked with GM's marketing department to set up a plan to develop the Chicago Negro market. Once a program was set up, help was given divisional personnel to execute the plan.

Program consisted basically of staging demonstrations in chains and large supermarkets. In all, 60 supermarkets, including A & P, Kroger, and Jewel Tea, had Negro women demonstrators who distributed free cookies and "Betty Crocker's Pie Parade Cookbook." A 15¢ coupon was inserted in magazine copies distributed in Chicago.

The result: Out of some 36,000 families who participated, almost half, or 15,000 households, bought Gold Medal flour.

It is important for a food manufacturer to know what the Negro market is for his products. Then it is important to set up a program to develop the market.

There is no pat answer for bringing this off. The campaign should, however, follow the formula used successfully by many marketers—i.e., recognition, identification, and invitation.

One of the basic differences that sets this market apart is the Negro's inability to personally identify with the majority population, which he has been conditioned to view in an impersonal way.

A food manufacturer should understand, for example, why an advertisement featuring a social scene in a restaurant or a white social gathering holds little interest for the Negro. Such scenes are, for the most part, unrealistic to him. That's because economics, housing, and social standards, condition him to think and respond as a Negro.

The Negro relies heavily upon familiar brand names; he has been sold shoddy merchandise too

PERSONAL IDENTIFICATION is key to successful merchandising in Negro market. National Dairy's Sealtest, modifying its policy of not showing people in point-of-purchase material, now includes personal element for in-store aids used in Negro areas.

many times. Also evident is his concern for both quality and luxury. His purchase of brand name merchandise helps compensate for the stigma of being classed a second-class citizen. Further, he is extremely loyal once he is sold.

Where does the Negro find the personal *identification* that he seeks? He finds it in Negro newspapers, magazines, Negro-appeal radio programs, motion pictures, and through association with others.

In *his* media, he sees himself reflected. At home service shows, which are aimed directly at him and where he sees his familiar organizations as participants, his response is far greater than under less personally gratifying circumstances. Such shows offer food marketers an opportunity to build for future sales, and generate good will.

Use of Negro subjects in advertising to establish identification has increased in practice—today more than 150 companies use Negro models. Such models have a greater receptivity among Negroes.

Find Your Sales Targets

Where are sales made in the Negro market? According to USDA, Negroes spend up to 12% more in supermarkets and other retail food outlets on a per capita basis than do comparable-income white families.

What does a company do when it learns that Negroes are prime customers for its product? Here, General Baking's experience is instructive.

According to A. Waldron Stone, GB's advertising manager, it was discovered that not only did Negroes buy more bread per capita, but they preferred a sweeter loaf. Today, GB markets a sweeter loaf, known as "Honey-Sweet." Wrapped in clear cellophane, it is sold only in Negro areas. Sales of "Honey-Sweet" have proved the move to be a good one, Stone reports.

Extending the invitation to Negro consumers can take many forms. Negro-oriented media can carry direct appeals, which can be bolstered at the point-of-sale. Some companies use Negroes as home economists and demonstrators, and coordinate promotions with club groups, home service shows, and retail outlets.

Use of Negro celebrities, both in testimonials, and as representatives, has grown. Ward Baking employs world tennis champion Althea Gibson as a community relations representative.

BIGGER SUPERMARKETS are being built in expanding Negro neighborhoods. A Harlem, N. Y., outlet boasts 56 feet of frozen food cabinets. One reason for this trend: Negroes spend up to 12% more in supers on a per capita basis than comparable income whites.

Pet Milk maintains an active program in the Negro community. For 14 yr., the company has used the famed Fultz Quads in advertising and personal appearances. The company also sponsors a weekly radio program of spiritual and gospel music on some 61 radio stations beamed to the Negro market.

Another dairy outfit, Carnation, conducts successful "Healthy Baby Contests," aimed solely at the Negro market.

Sealtest Ice Cream (National Dairy Products) has a policy of not using people in advertisements or on point-of-purchase material. Company is now modifying this policy to make it more productive in the Negro market.

Use of Negro-appeal p-o-p pieces has jumped at a rapid rate. There seems to be an "eagerness of retailers to use p-o-p material to create a friendly atmosphere," according to one observer.

Help is needed for the retailers in expanding Negro neighborhoods. As Negroes extend their residential boundaries, quite often other residents begin moving out.

Neither the small retailer, who has invested hundreds of dollars, nor the chain store, which has invested thousands, can always afford to move. Rather, they must stay and "sell" the new customers. Most retailers are grateful for any preselling assistance they can get. This help, which can take many forms, should include advertising in Negro media, p-o-p material, and the personal contact offered by Negro sales and good will representatives.

Marketers should be careful to avoid creating an atmosphere that will offend or antagonize Negro consumers. Although "Aunt Jemima" and "Uncle Ben," for example, are well-established brand-identity characterizations, it would be unwise for a marketer to try to introduce any such character today. (End)

Want More Info?

Here are leading sources for helpful surveys and information on the Negro market:

Associated Publishers, 55 West 42nd St., New York 36, N. Y.

Defender Publications, 55 West 42nd St., New York 36, N. Y.

Interstate United Newspapers, 545 Fifth Ave., New York 17, N. Y.

Johnson Publishing Co., 1270 Ave. of the Americas, New York 20.

Motion Picture Advertising, Service Company, Inc., 245 West 55th St., New York 19, N. Y.

Rollins Broadcasting, 414 French St., Wilmington, Del.

Rounsaville Radio Stations, Peachtree at Mathieson, Atlanta 5, Ga.

WDIA, P. O. Box 5125 Memphis 12, Tenn.

Grateful acknowledgment is made to EBONY magazine for use of photos accompanying this article.

Keeping Accurate Records Is Key to Successful Maintenance

Maintaining materials handling equipment can be less costly, more efficient by keeping accurate records. Here's a plan patterned on maintenance of industrial lift trucks

SOME PLANT MANAGEMENT people may feel that the cost of maintaining materials handling equipment is not only a burden, but an uncontrollable one as well. This is not true.

The composite experience of a number of companies has proved that overall costs of equipment maintenance can be lowered and overall efficiency raised when the maintenance department is operated on a businesslike basis.

The single, most effective technique for accomplishing this is an orderly, easily-managed system for keeping and analyzing maintenance records on each piece of handling equipment.

Keeping accurate records on the maintenance and servicing of handling equipment will produce these results:

► **Reduce unscheduled equipment downtime** by providing for periodic checks where minor troubles are spotted and corrected before they cause equipment failure.

► **Furnish accurate operating costs** on each piece of equipment so management can decide intelligently whether to replace or overhaul it.

► **Increase efficiency of mechanics** by providing them with service check lists which will systematize their work.

► **Reduce overall** maintenance costs by organizing work.

► **Provide purchasing department** with means of accurately forecasting purchases of "normal wear" items.

JOHN M. SQUIER
Manager, Service Engineering, Industrial Truck Div., Clark Equipment Co., Battle Creek, Mich.

Record Provides History

In the case of lift-trucks, a successful maintenance program depends on a well-kept record of each machine. This record should include every bit of information that will insure the wisest use of equipment at the lowest cost. Items to be included are:

1) Serial number, capacity, make and type (type of power, attachments, or other distinguishing features should be included).
2) Date the machine was placed in service.
3) Where and how equipment is used.
4) Number of hours or miles logged daily.
5) Scheduled maintenance, including nature of repairs.
6) Unscheduled maintenance, including nature of repairs.
7) Name of mechanic who serviced equipment.
8) Time spent on each maintenance operation.
9) Parts used, i.e., the number and cost of each.
10) Fuel and oil consumed.

Hour Meter Helpful

A maintenance check list containing the above information should be used at periodic intervals. And it should be based upon the number of hours or miles each machine operates. Maintenance schedules will vary with different operations but inspection and servicing are suggested at four intervals—after 8, 40, 500 and 1000 hours of truck operation.

Since periodic servicing is based upon the hours a machine operates, an hour meter on each piece of materials handling equipment is an indispensable maintenance tool. Supplied by most manufacturers as standard equipment, the hour meter is the main link between records and machines.

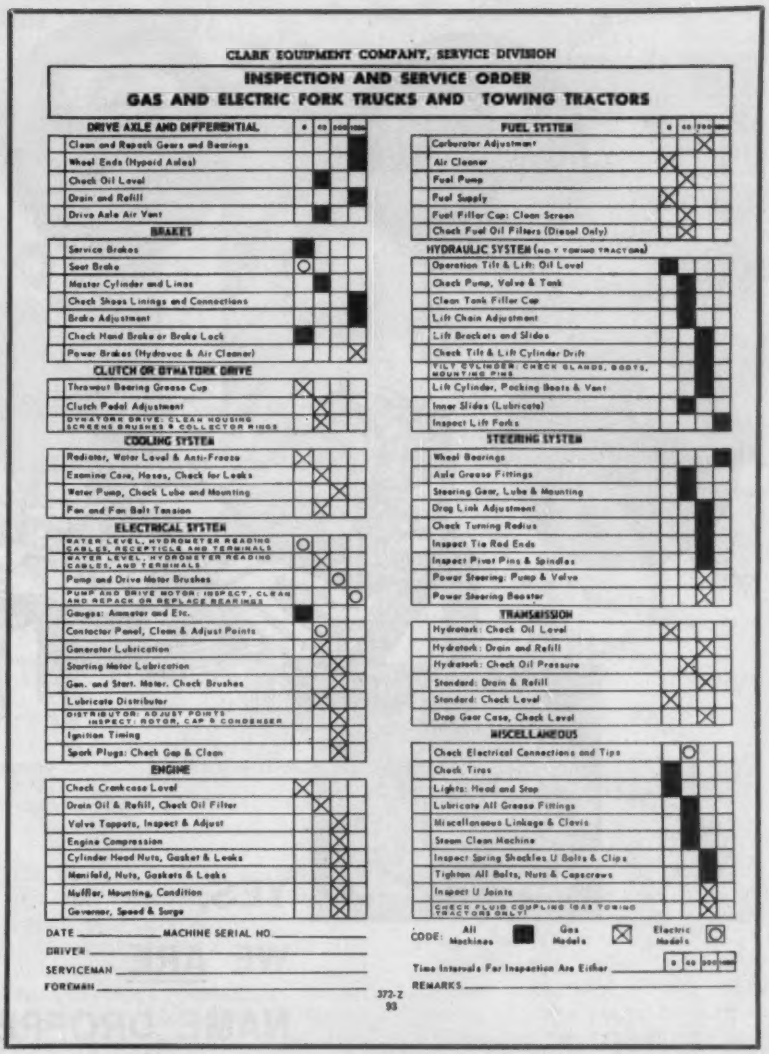
Without knowing either the

hours or miles a machine operates, there is no accurate way of determining when basic servicing (oil changes, greasing, battery charging) or major servicing is due. By knowing the hours or mileage, your maintenance supervisor can consult a service check list to determine the servicing required on any piece of equipment.

These check lists can be established by plant personnel, based on individual plant experience and problems, but it is wise to consult with your equipment manufacturer for factory recommendations.

Most equipment manufacturers furnish such check lists (sample illustrated in this article) which you can follow or use as a basis for setting up your own list.

Often individual plants have peculiar operating conditions which require special tailoring of check lists. In such cases the manufacturer can help by surveying the operation and making specific recommendations. Some plants use a driver service order in addition to check lists.



CLARK EQUIPMENT COMPANY, SERVICE DIVISION

INSPECTION AND SERVICE ORDER
GAS AND ELECTRIC FORK TRUCKS AND TOWING TRACTORS

DRIVE AXLE AND DIFFERENTIAL	8	40	500	1000
Clean and Repack Gears and Bearings				■
Wheel Ends (Hypoid Axles)				■
Check Oil Level			■	
Drain and Refill				■
Drive Axle Air Vent			■	

BRAKES				
Service Brakes	■			
Seat Brake	○			
Master Cylinder and Lines			■	
Check Shoes Linings and Connections				■
Brake Adjustment				■
Check Hand Brake or Brake Lock	■			
Power Brakes (Hydrovac & Air Cleaner)				⊠

CLUTCH OR DYNATORK DRIVE				
Throwout Bearing Grease Cup	⊠			
Clutch Pedal Adjustment		⊠		
DYNATORK DRIVE: CLEAN HOUSING SCREENS BRUSHES & COLLECTOR RINGS		⊠		

COOLING SYSTEM				
Radiator, Water Level & Anti-Freeze	⊠			
Examine Core, Hoses, Check for Leaks		⊠		
Water Pump, Check Lube and Mounting		⊠		
Fan and Fan Belt Tension		⊠		

ELECTRICAL SYSTEM				
BATTERY LEVEL, HYDROMETER READING CABLES, RECEPTICLE AND TERMINALS	○			
BATTERY LEVEL, HYDROMETER READING CABLES, AND TERMINALS		⊠		
Pump and Drive Motor Brushes			○	
PUMP AND DRIVE MOTOR: INSPECT, CLEAN AND REPACK OR REPLACE BEARINGS				○
Gauges: Ammeter and Etc.	■			
Contactor Panel, Clean & Adjust Points		○		
Generator Lubrication		⊠		
Starting Motor Lubrication			⊠	
Gen. and Start. Motor, Check Brushes			⊠	
Lubricate Distributor		⊠		
DISTRIBUTOR: ADJUST POINTS INSPECT: ROTOR, CAP & CONDENSER			⊠	
Ignition Timing			⊠	
Spark Plugs: Check Gap & Clean			⊠	

ENGINE				
Check Crankcase Level	⊠			
Drain Oil & Refill, Check Oil Filter		⊠		
Valve Tappets, Inspect & Adjust			⊠	
Engine Compression			⊠	
Cylinder Head Nuts, Gasket & Leaks			⊠	
Manifold, Nuts, Gaskets & Leaks			⊠	
Muffler, Mounting, Condition			⊠	
Governor, Speed & Surge			⊠	

FUEL SYSTEM	8	40	500	1000
Carburetor Adjustment				⊠
Air Cleaner	⊠			
Fuel Pump			⊠	
Fuel Supply	⊠			
Fuel Filler Cap: Clean Screen			⊠	
Check Fuel Oil Filters (Diesel Only)			⊠	

HYDRAULIC SYSTEM (NOT TOWING TRACTORS)				
Operation Tilt & Lift: Oil Level	■			
Check Pump, Valve & Tank		■		
Clean Tank Filler Cap		■		
Lift Chain Adjustment		■		
Lift Brackets and Slides			■	
Check Tilt & Lift Cylinder Drift			■	
TILT CYLINDER: CHECK GLANDS, BOOTS, MOUNTING PINS			■	
Lift Cylinder, Packing Boots & Vent			■	
Inner Slides (Lubricate)		■		
Inspect Lift Forks				■

STEERING SYSTEM				
Wheel Bearings				■
Axle Grease Fittings		■		
Steering Gear, Lube & Mounting		■		
Drag Link Adjustment			■	
Check Turning Radius			■	
Inspect Tie Rod Ends			■	
Inspect Pivot Pins & Spindles			■	
Power Steering: Pump & Valve			⊠	
Power Steering Booster			⊠	

TRANSMISSION				
Hydratork: Check Oil Level	⊠			
Hydratork: Drain and Refill				⊠
Hydratork: Check Oil Pressure		⊠		
Standard: Drain & Refill				⊠
Standard: Check Level	⊠			
Drop Gear Case, Check Level				⊠

MISCELLANEOUS				
Check Electrical Connections and Tips		○		
Check Tires	■			
Lights: Head and Stop	■			
Lubricate All Grease Fittings		■		
Miscellaneous Linkage & Clevis		■		
Steam Clean Machine			■	
Inspect Spring Shackles U Bolts & Clips			■	
Tighten All Bolts, Nuts & Capscrews			■	
Inspect U Joints				⊠
CHECK FLUID COUPLING (GAS TOWING TRACTORS ONLY)				⊠

CODE: All Machines ■ Gas Models ⊠ Electric Models ⊡

DATE _____ MACHINE SERIAL NO. _____
DRIVER _____
SERVICEMAN _____
FOREMAN _____

Time Intervals For Inspection Are Either _____ 8 40 500 1000

REMARKS _____

372-Z 93

TYPICAL INSPECTION check list for maintaining gas and electric fork trucks and towing tractors shows all operations to be performed at 8, 40, 500, and 1,000 hr. intervals. It covers ten general areas plus miscellaneous items for servicing.

How To Keep Records

Since record keeping usually is done by the mechanic, the forms and check lists should systematize his work, making it easy to record data, and thus make his job easier. Methods of keeping maintenance records should not be complicated. In fact, the simpler the method, the better.

Record keeping systems vary according to individual plant operations or preferences of service personnel. One plant uses a service log attached to each machine. Another company records maintenance information on cards used with an electronic data processing setup.

Regardless of technique, the most important requirement of any record keeping system is that the records be kept and that complete maintenance information on each machine be centralized and easily accessible.

Once record keeping has been established, maintenance personnel should be supervised to insure that all requested information is recorded.

Evaluate Existing Records

It's important that your maintenance records provide all necessary information for evaluating the entire materials handing operation from a cost standpoint.

To determine if your records are complete, examine them and ask these four questions:

1) Do records show when machines were purchased and how many hours or miles per month each unit operates?

2) Do records provide an accurate account of money spent on each machine for maintenance and fuel?

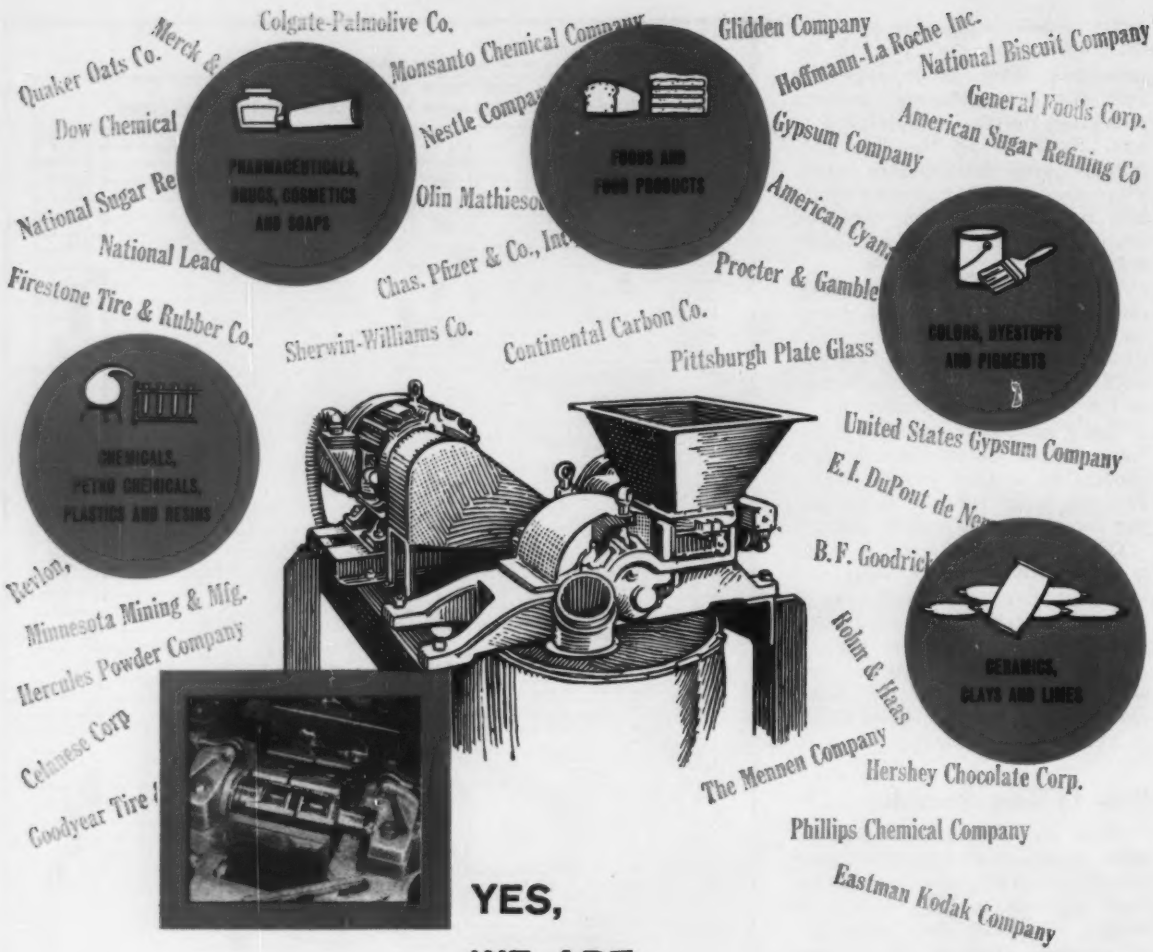
3) Does maintenance department have a check list of major points to inspect at each daily, weekly, and other servicing periods?

4) Is all unscheduled downtime reported accurately (so that responsibility for it can be fixed)?

If each of the foregoing questions can be answered affirmatively, then chances are the maintenance program is functioning well.

No maintenance program is so complete that breakdowns will be entirely eliminated. But a well-administered program can reduce unscheduled equipment downtime to a minimum. Also good record keeping enables a supervisor to fix responsibility since the mechanic's name appears on the maintenance report.

A properly supervised and documented maintenance program is one of the best possible investments of management time. The alternative is to invite high costs of unscheduled downtime and disorganized maintenance. (End)



YES, WE ARE NAME DROPPERS!

Because we are proud of the customers who use MIKRO-PULVERIZERS . . .

In the montage of names that form the background of this ad you will find just a sampling from our published list of prominent MIKRO-PRODUCT users in the process industries. They represent companies of all sizes . . . all equally prized.

Each of these MIKRO-PULVERIZER owners operates a unit with a distinct individuality . . . an internal mechanism adjusted to handle a particular job either in dry-grinding or wet milling.

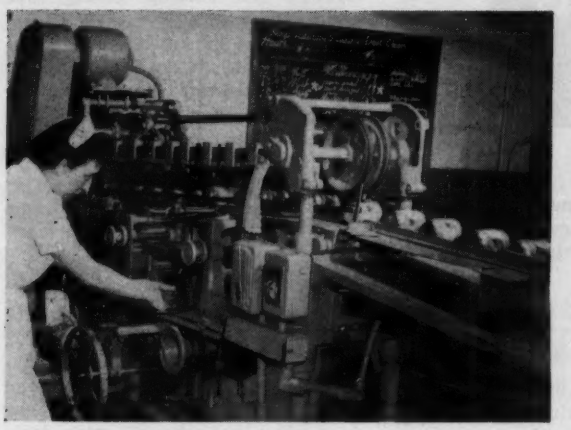
If you want to know what a job-designed MIKRO-PULVERIZER has to offer you in the way of fine or ultra-fine grinding, precise particle size control, and economy of power and maintenance, write for Bulletin 51A.

MIKRO-Products
PULVERIZING MACHINERY COMPANY
97 Chatham Rd., Summit, N. J.
A Division of American-Marietta Company

PROCESSING SYSTEMS
GRINDING CONVEYING COLLECTING

REPRESENTED THROUGHOUT THE WORLD IN SALES, SERVICE AND MANUFACTURING FACILITIES.

2 Cost-Cutting Tips



ROLL-THROUGH labeler eliminates hand-set operation, speeds up production (500-600 jars/min.) at lower unit costs.

BREAKAGE of fragile containers is sharply reduced by partition-type case packer.

Upgrading 'Packaged' Profits

You can make money at the package-filling step if you know how. Trick is to take advantage of machinery maker's free advice

IMPORTANCE of good packaging, both as a merchandising technique and as a protective device, is a truism in the food industry. Not so universal, however, is the awareness that the packaging operation itself — actual placing of the product or unit into a case or carton—can have an even more important effect on profits.

Today, there is no need for "make-do" packaging equipment. Machinery makers have broadened their line to a point where there is a machine designed for virtually every type of installation. And since packaging machinery is not a shelf item, a setup can be planned for a specific application.

No Lonesome Joes Here

Planning the packaging operation is not one which the food processor need face alone. Most major suppliers maintain a competent field sales engineering force, backed by a qualified home-office engineering staff. These combined talents, together with the user's knowledge of his product and methods, unite into an expert planning group.

Innovations in equipment and planning techniques have brought food-beverage packaging to an almost-scientific point. Machinery makers today, more than ever before, are willing to work out customers' needs in terms of those needs, rather than in terms of equipment immediately available.

For example, when a grocery product manufacturer recently opened his new plant, he wanted a method of mechanically unloading bottles in such a way that case debris could not fall into the containers. And, he wanted to avoid the air-cleaning or bottle-washing steps.

The solution worked out was unique. Bottle suppliers were asked to package their wares so that containers would be bottoms-up when the re-use type case was opened. Machinery manufacturer developed an unloader that took the bottles out of the box in the upside-down position, kept them that way until clear of the case, then flipped them just ahead of the filling stage.

Such supplier-user cooperation has become an almost standard approach to packaging problems. In one instance, a bagged coffee processor called in his supplier to solve what looked like a tough problem: How to case-load 1-lb. bags automatically. A quick study showed there were no known installations in which bagged coffee

Planning Ahead

You can get a head start on new-equipment problems that may crop up later on by making sure that your personnel are well-briefed on all aspects surrounding the new unit.

Standard service contract between user and machinery maker calls for a supplier's representative to supervise the installation and start-up of new equipment. Before the rep leaves your plant, be sure that your operator is completely familiar with the machine, and that the proper persons know what's involved in ordering new parts, routine maintenance, etc.

Sometimes, machinery makers will hold special "seminars" for your personnel. Typical of these is a 4-day meeting on a new bacon machine recently held for employees of a meat packer.

KAYE HOLSTEBRO
Manager-Sales Applications Engineering, Emhart Mfg. Co., Portland Div.

WHY GAS PACKAGING IS GROWING

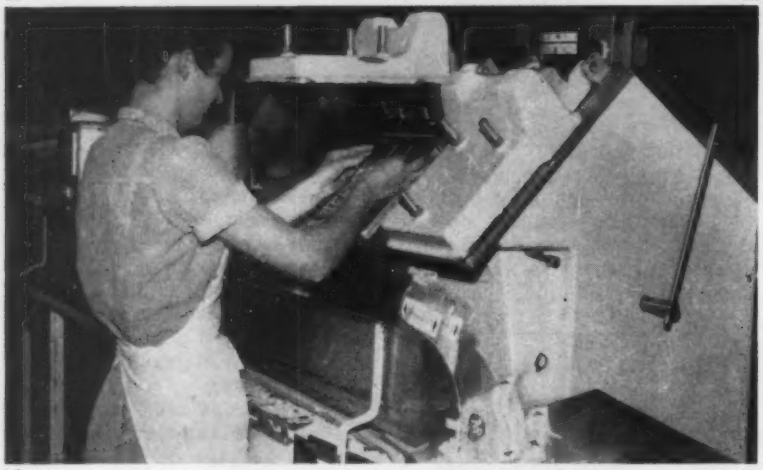
More food manufacturers are converting to inert gas packaging to get longer, more positive protection that assures freshness and color.

BULK HANDLERS shipping and storing fruits and vegetables under a blanket of inert gas report they can detect no degradation in a product so protected.

COFFEE, CHEESES AND MEATS . . . products dependent on freshness are now being packaged this modern way with excellent results.

SILO STORAGE of alfala under a protective gas blanket has become general practice in the farm belt.

PACKAGED GENERATION SYSTEMS have paved the way for the increased use of gas for they have brought gas prices in line where even the smaller processors can afford to produce their own atmospheres.



GAS ATMOSPHERES originated the packaged unit and is a leader in the design and development of complete systems for the production of high purity nitrogen, carbon dioxide, hydrogen, inert, reducing and annealing gases, dryers and purification equipment.

To get further information on generation equipment for your specific application write *Gas Atmospheres, Inc., 3855 West 150th Street, Cleveland 11, Ohio.*

gas Atmospheres, inc

4132

BETTER PACKAGING BETTER PACKAGING BETTER PACKAGING

Decision Simulation at Pillsbury . . .

'Business Games' Provide Pilot Plant for Managers

Simulation can be a valuable addition to your management training program. Here's benefits achieved by Pillsbury and how it actually feels to take part in a 'business game'

SIMULATION has created a "pilot plant for managers." Recent advances in manager training have provided a device whereby costly errors resulting from inadequate management experience can be analyzed and reduced.

Ricciardi, Bellman, Craft and others developed the original AMA simulation game involving five firms competing against each other for volume and profit in a total economy. A basic model was built to express relationships among the various economic and financial factors determining profitability.

At the same time, The Pillsbury Co. was contemplating a divisionalization and decentralization of its organization and management functions. This required placing decision authority further down in the organization where the most timely information existed and where the action took place.

As we worked with our management in analyzing this major change, we recognized the appropriateness of simulation and, with our operations research people, began to develop a general management business game. During '58 and '59, six seminars utilizing this technique were held, involving some 120 upper middle managers.

Program's objectives were to provide:

► **An opportunity** to explore the complex conditions leading to sound decisions.

► **A climate** in which managers could freely test soundness of their own decisions.

► **An awareness** of the many inter-relationships within the corporate structure.

► **An understanding** of Pillsbury objectives and policies concerning divisionalization, decentralization, etc.

Sales Games, Too

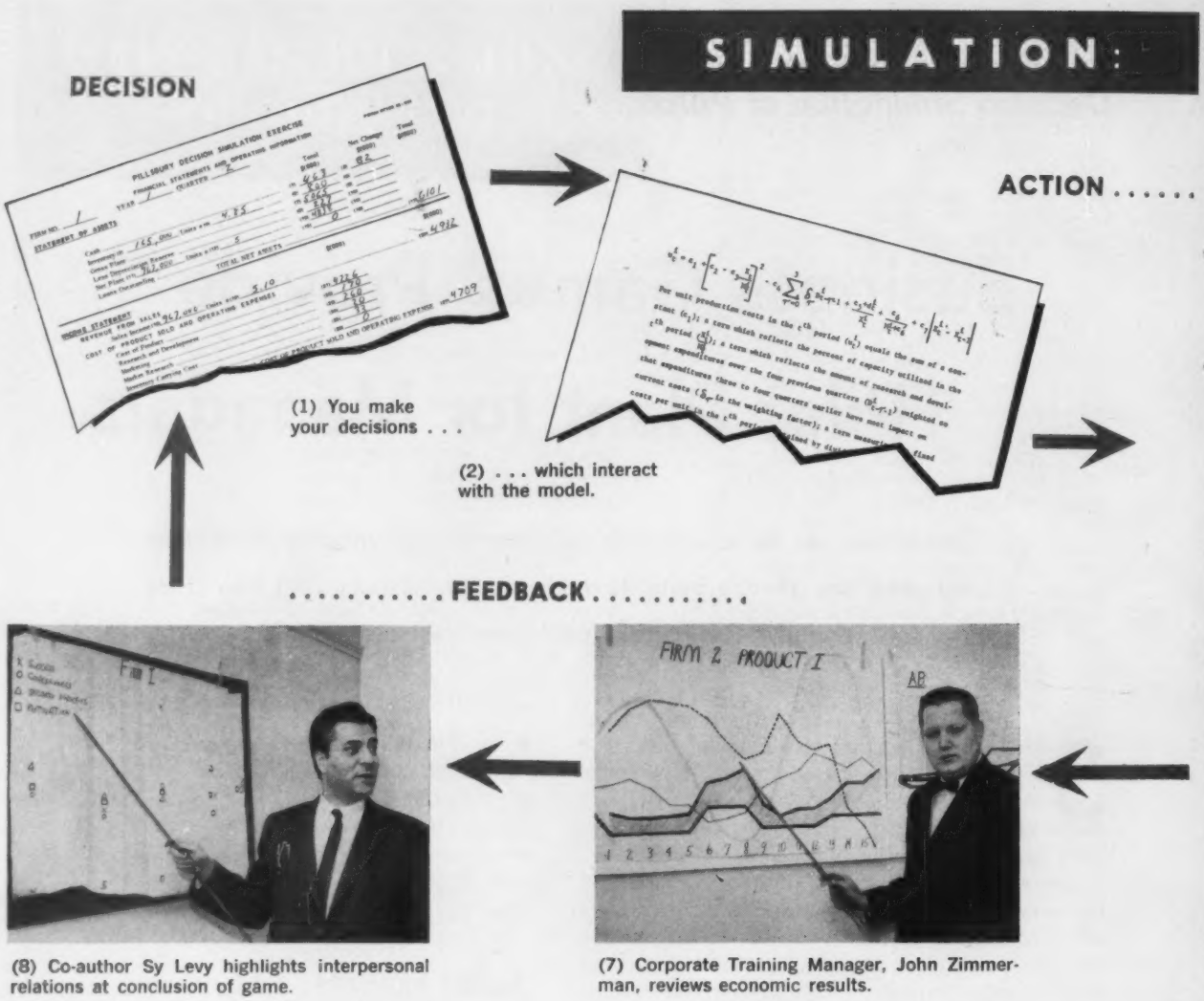
As we learned our way with simulation, we determined functional training needs in our sales areas, since decisions here were to be pushed farther down the line to lower levels. A systematic training approach was needed for these managers. We developed a sales simulation game which has the same general format as our general management game but the relationships, economic outcomes, and processes involved primarily concern sales managers' decisions.

In '59 and '60, seven seminars, involving 175 sales managers, were held.

Process of decision-making parallels the servomechanism concept in engineering, i.e., as a system deviates from a particular standard, there are forces initiated to restore the equilibrium.

In the decision-making context, the manager develops a target or goal that he strives to achieve, carries out some plan to achieve this goal, discovers a discrepancy between the consequences of his action and the desired goal, and then initiates a process of re-defining the plan

SY LEVY and JOHN ZIMMERMAN
Respectively, Manager of Personnel Research & Manpower Development, Pillsbury Co., and member, Kepner Tregoe & Assoc.



(8) Co-author Sy Levy highlights interpersonal relations at conclusion of game.

(7) Corporate Training Manager, John Zimmerman, reviews economic results.

and carrying out different actions designed to achieve the goal.

Just as this servomechanism model is basic to the decision-making process, it is also a basic model for learning. Learning is dependent upon three conditions: (1) an anticipated discrepancy from some desired goal; (2) experimental action designed to achieve this goal; and (3) the presence of information for feedback.

Simulation situation is a setting that elicits a particular class of behaviors designed to solve a defined set of problems. Addition of a series of continuous feed-backs to the decision maker indicates the effectiveness of his actions.

How It Feels

What's the experience really like for a manager undergoing this kind of training?

About two weeks prior to the seminar, you receive a kit of material describing the economics of the simulated economy in general and a specific set of instructions regarding operation of the game. This includes your firm's history and its current operating and financial picture.

You have a tough time digesting complex business relationships because you normally do not see your specific job in its total complexity.

As a production manager, for example, you've been concerned with production data. Now you see marketing, research, sales, and financial data.

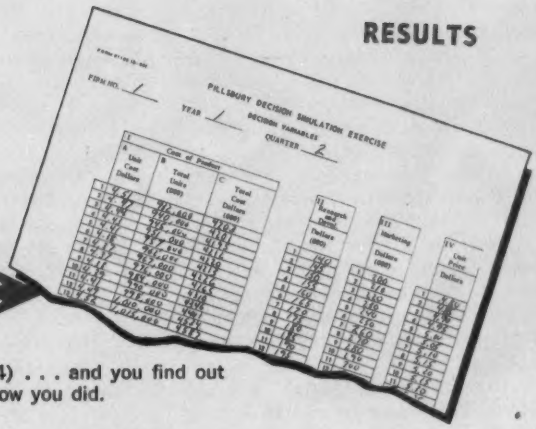
As you come to the seminar you read in the Wall St. Journal (a simulation) that The Pillsbury Co. has acquired a series of companies in a related industry. You and three of your associates have been commissioned by the Board of Directors (a simulation composed of the other participants) to operate this company for the next five years.

Typical firm team (as illustrated in Fig. 5 photograph) might include Pillsbury's Chuck Fish, Director of Mix Packaging & Processing; Ovel Johnsrud, Accounting & Control Manager; Mike Harper, Director of Industrial Engineering; and Jim Kennedy, Brand Supervisor.

You have been in development seminars before where you sat in your chair and listened to speakers talk endlessly. Now, no one is talking and you suddenly find yourself face to face with some very real business problems.

A Decision Model

RESULTS



(4) . . . and you find out how you did.

. . . . . REACTION

(3) Computer goes to work (at CEIR's Washington headquarters via long distance telephone) . . .

GOALS

(5) Plan and results are reviewed against targets by Firm No. 1 team.

(6) "Report to the Board" setting adds realism to review of game's performance.

Decisions to be made specifically involve production costs, R&D expenditures, market research, loans, dividends, etc. Four overall guide areas are given to channel your actions — Objectives; Organization; Planning, Budgeting and Forecasting; plus Team and Individual evaluations.

Via long distance telephone, you can make use of computer services at the Washington, D. C., headquarters of the Corporation for Economic and Industrial Research (CEIR).

Then It Begins

You are the president with all of the responsibilities accorded. As your first quarter report comes in, you discover that you have lost share of market. Production costs and inventory are rising.

Your managers are concerned. "What happened? Did we move the price too high? Did we put too little money into marketing? Should we buy some market information? We need money for research! We have to borrow! What about the stockholders?"

Time is short. You have no plan, so you meet the crises and quickly make a series of judgments. Everybody helps, but some nod and shake their heads. After the decisions are turned in, there is some soul-searching. Facts get analyzed. Someone asks about objectives. And results are eagerly awaited.

Soon, second quarter reports are in. Chaos and despair! "What happened? We lost share again. Firm No. 2 has cut the price. Somebody is putting an awful lot of money into marketing. We need more market research. We need operating capital. Look at our inventory. I think we should up the price. I think we should lower the price. We can't give 'em away." And so it goes.

If you think this is mayhem, you are probably quite right. But, as the quarters go by, learning begins to take place. You, as the president, begin to recognize that the definition of problems and opportunities is the most important step at the outset.

The Battle Back

A plan develops. You begin to use the information being fed back with each quarterly report. Budgets for expenses and time are developed. You begin to organize and to delegate responsibilities. Sales and marketing, production,

and finance functions emerge. Your job is now to integrate and coordinate the responsibilities that have been assigned.

And things begin to look up. Your share of market is coming more in line with your target. Plant capacity is more fully utilized. Inventory control takes on meaning. You begin to use data in some systematic fashion. Causes and relationships begin to make sense. The intricacies of finance, capital and stock take on new meanings. The economic cycle becomes more predictable. Prosperity or recession causes fewer panics.

Alternative strategies are applied. You learn to use inventory as one way of flexibility for pricing policy. You begin to see and plan against new product development from the time of research expenditure. You recognize the diminishing pay-off when all of your dollars are invested in one direction.

As you get additional feedback, you learn that decision-making does not take place in a vacuum and that your decisions have to be predicated on as much information as you can gain about your competitors' probable actions.

Your sales manager begins to collaborate with the production manager to obtain proper balances and meet targets. The accounting and financial function takes on a new light as you recognize the value of the controls that it can provide along with information. Your servomechanism process is beginning to function effectively.

You're in Control

As the final quarter reports come in, the results in different areas are quickly assigned to the individual responsible. There is no confusion. There is an atmosphere of calm, serious, involved decision-making.

Individuals recognize they have problems to solve. They compare results with predictions and identify the discrepancies. Information that is linked with the more general company plan is shared. Decisions on courses of action come more readily because you have already agreed on basic premises and strategies for dealing with economic and financial problems.

You are concerned about the future and various alternative strategies to deal with possible future situations. Your managers are alert to stock market indicators and other factors that may foretell a decline or an upswing in the cycle. You have identified to some extent the strategies that other firms are following.

As the reports are analyzed, let's tune in on some team member reactions:

. . . "We predicted the market size within 20,000 units and our share is just as we figured—24%."

. . . "Team No. 2 is loading up on inventory. We better watch a price maneuver."

. . . "Team No. 5 ran a deal. They cut the price but we were ready for it. Our top product quality showed us that we could command this higher price in a rising economy."

. . . "Our inventory is in balance with our production and sales, and return is within the tolerances we set."

. . . "Our marketing expenditure appears to have reached a point of diminishing returns."

. . . "Well, our decisions are ready ahead of schedule. Let's begin that 'Report to the Board.'"

You and your firm members continue preparation of this report. This is the first phase of critique and feed-back. You start to analyze the reasons for your final position:

. . . "You know, fellows, as I look at how variable our pricing was for the first three years, it's no wonder we couldn't get any consistent profits."

. . . "We never pumped enough money into marketing during this time to justify our high price."

. . . "And look how we bought market information — as though we really had a plan. Somebody asked for it, so we bought it."

. . . "Our dividend policy in those early years was a joke. We were practically on the rocks and still paying out a 20% dividend. We should have written the stockholders a nice letter and put that money to work."

. . . "These early crude attempts at controls indicate flying by the seat of our pants. We really didn't have a plan or any targets to test our decisions against. We didn't know whether we were doing well or whether we were just lucky."

And so your "Report to the Board" is built. Certainly, the members of each firm or team make an attempt to justify their position, whether plus or minus. But this is a process deeper than just a business game. It is an opportunity for real learning about one's thinking processes in stress situations.

At the Board Meeting, learning is achieved not only through the presentation of each firm's report, but in comparing your expectations of the other firms' behaviors with their actual reports and reasons for decisions.

Report Analysis

Following presentation of reports, a "security analyst" (staff economic expert) presents an economic analysis of each firm's operations to the Board members. Each reflects the members' description of their intentions and perceptions of what their firm has done, based upon limited knowledge about the total economy and the strategies and actions of the other firms.

Analyst, however, is in full possession of each of these firms on all the significant economic dimensions plotted throughout the entire 20 quarters. He is in a position to evaluate a variety of relationships that individual firms may not be able to discover for themselves.

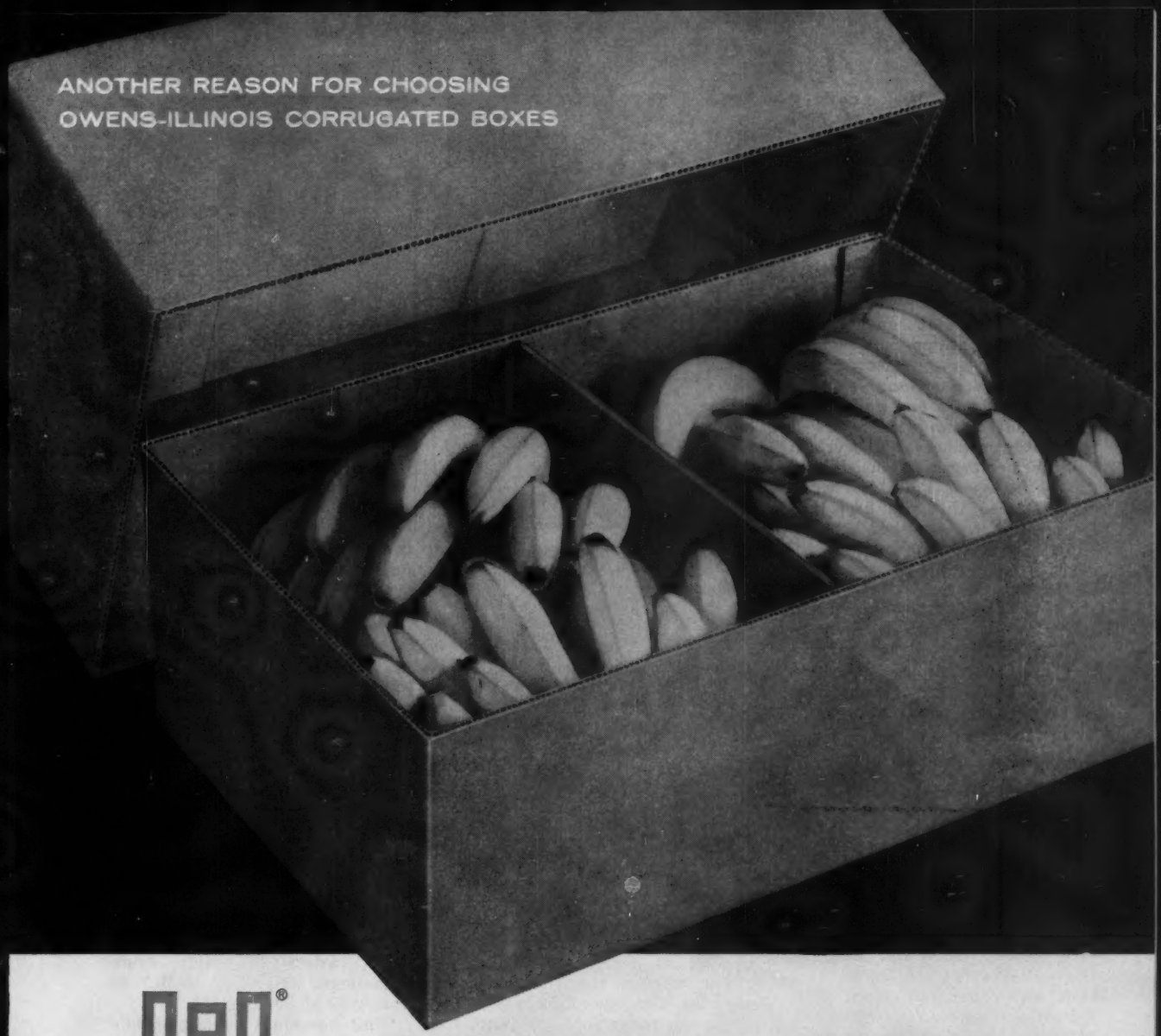
Now you see in good visual manner the results of all your actions on a number of meaningful scales. You see all of the factors, both absolute and relative, that had a bearing on your sales and share of market. You see your marketing and research expenditures compared with price, both for your firm and for all firms. You see the impact of the total combination of decisions by all firms at any point in time with the corresponding total market at that particular point.

Overall Benefits

As the economic review continues, you discover that you are getting a total look at industry from a point of view that you never can attain in real life. There is never a situation where complete information exists. However, the review indicates some of the gaps that you must try to fill on the basis of incomplete information on the job. It also emphasizes some of the kinds of data and controls that are necessary to resolve some of this uncertainty.

While the intention here is not to send you back to your job with a set of ready-made answers, principles begin to emerge which have as much application in the right

(Turn to p. 52)



MR. STRONGBOX

LOCALIZED SERVICE FROM:

Atlanta, Ga.	Long Island City, N. Y.
Aurora, Ind.	Los Angeles, Calif.*
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Bristol, Pa.	Memphis, Tenn.
Chicago, Ill.	Mercedes, Texas
Dallas, Texas	Miami, Fla.
Detroit, Mich.	Milwaukee, Wis.
Flint, Mich.	Minneapolis, Minn.
Jacksonville, Fla.	Newark, N. J.
Kansas City, Mo.	Oakland, Calif.*
Salisbury, N. C.	

*These plants are operated by National Container Corporation of California, subsidiary of Owens-Illinois.

How Owens-Illinois corrugated boxes offer bananas the protection they deserve

No longer is it necessary to subject delicate bananas to bouncing and banging on docks and in warehouses as they are when shipped on the stalk, in bulk.

These hands of bananas were pampered by an Owens-Illinois corrugated box from the time they were picked in Honduras until they were opened in New York City. Because these select, matched bananas keep their good looks, they produce more sales, more profit, less retail shrink.

This special box offers other advantages. It is 1) *disposable* (no deposits or pile-ups between pickups), 2) *compact* (reduces storage space by almost 50 per cent), and 3) its weight and dimensions make it ideal for handling.

Might a new approach be a better answer to your shipping problems?

PAPER PRODUCTS DIVISION
FORMERLY NATIONAL CONTAINER

OWENS-ILLINOIS
GENERAL OFFICES · TOLEDO 1, OHIO

CIRCLE 51 ON INQUIRY CARD

situation back on the job as they had to your successes and failures here in simulation.

A final non-economic but important principle needs mention. Four men working together on a common goal in a situation of stress have to learn through trial and error the most effective ways of inter-relating with each other in order to achieve the goals which they have set. Consequently, interpersonal relationships among firm members are reviewed.

Anonymous questionnaires are completed while the decisions are being made. Results are reviewed with firm members and certain principles or organizational behavior are stressed. Point is clearly demonstrated that the firm that is able to work together as individuals is a firm whose orderly decision-making processes are not affected by failure.

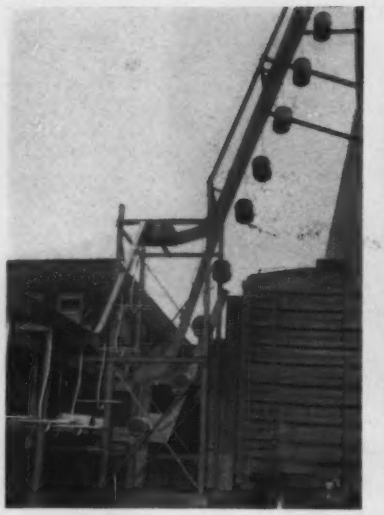
The key to effective organization is the ability of task-oriented individuals to work cooperatively, to share information, and to collectively solve the management problems they face.

Back on the Job

After a week of simulation, Monday comes around and you're back on the job. As you approach decisions, you don't find yourself to be a new man with tremendous new insight and level of competency, but you do find yourself thinking about your thinking processes—about facts and information, alternative strategies, controls, and cause and effect.

During important decision-situations, you recall experiences that you had in the simulation, and you begin to integrate this new knowledge into your own operating patterns. (End)

"Like I said—there's still one little flaw to work out of it."



OUT OF BOXCAR: Empty drums nest into conveyor's free-swinging carriers for quick lift.

INTO STORAGE: Drums are transferred from conveyor to storage area above packaging floor.

Eases Empty-Drum Handling

Trolley conveyor cuts labor costs, gives easy access to economical storage area

HIGH LABOR COSTS often plague companies that bulk package products in drums. Handling of empties generally is tedious and time consuming, but it needn't be.

For example, the Griffith Laboratories, Chicago, uses a 480-ft. overhead trolley conveyor that . . .

. . . **Cuts handling labor** from boxcar to storage from 20 to 3 man-hours. One man loads drums from box car onto conveyor, while a second unloads from conveyor into storage.

. . . **Eliminates former manual loading** of empties on flat trucks and hauling some 1,000 ft. to a first-floor storage area. In addition, an elevator was used to store some drums on the third floor.

. . . **Frees freight elevator for** other jobs.

. . . **Makes empties readily available** for use in packaging department. They are now delivered by gravity feed at a moment's notice.

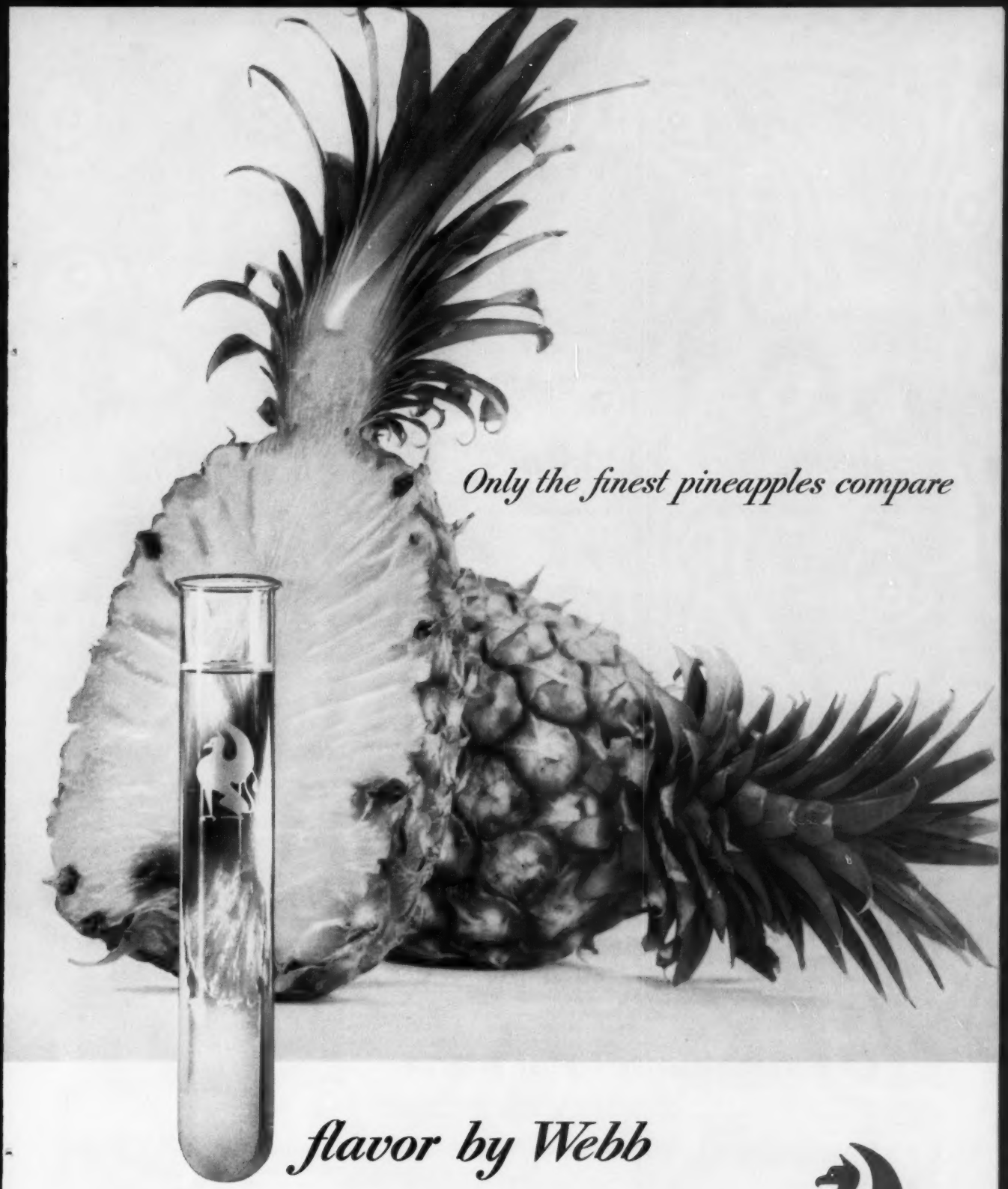
. . . **Improves plant safety** by eliminating congested areas.

. . . **Enables use of lower-cost** storage space. Formerly, empties were stored on the 1st floor, in space occupying 2,500 sq. ft.

The overhead trolley has 80 cradle-type carriers. It is driven by a 1-hp. variable-speed motor, with remote magnetic control starter and two pushbutton starters in the drum-storage area. A wide variety of empty drums (maximum weight of 50 lb.) are conveyed at 30 fpm.

Unit has eight horizontal idler turns, each with five cut-outs into which conveyor lugs ride while making 90-deg. turns, and anti-rollback safety stops. A 'mist' lubricating station is limit-switch-actuated by each carriage-riding roller. Conveyor sections installed outside the plant are protected with metal shields.

Conveyor's cable (⅜-in. dia.) consists of 12-in. sections reinforced with steel lugs (on ends) and interlocked by clamps. Latter are mounted to cable-riding rollers (2-in. dia.) supported on an I-beam. Suspender from each pair of clamps is a free-swinging, roller-bearing cradle carrier. Each carrier's 6-ft. vertical section (hook-shaped at bottom) is constructed of 1¼-in. galvanized pipe, with horizontal (cradle) section made of two ¾-in. pipes attached to two ¾-in. flat irons. Cradle section is 2x3 ft. (FE Staff)



flavor by Webb

Rich, ripe pineapple is one of the superb synthetic flavors perfected by Webb. It is available in several liquid versions and in spray-dried form to suit all applications. For samples and usage information to meet your specific requirements, please call or write Webb. Food flavor specialists for over 50 years.

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keep your cleaning dollars in balance

DuBois Chemicals sets the pace

DuBois delivers, in perfect proportion . . . the world's finest cleaners balanced with continuing service. The result: Concentrated cleaning at low cost plus . . . on-the-job technical assistance—*both*, from *DuBois*.

exclusive, cost-saving 6-point program

1. DuBOIS SETS THE PACE with the largest, technically-trained service group in the industry . . . to solve your cleaning problems, help train your personnel in maximum product efficiency.
2. DuBOIS SETS THE PACE with a vast number of warehouses strategically located to provide fast, efficient service.
3. DuBOIS SETS THE PACE creating the most complete line of chemical cleaning compounds . . . serving every phase of your operation.
4. DuBOIS SETS THE PACE providing almost a half-century of practical and technical "on-the-job" experience.
5. DuBOIS SETS THE PACE giving all the advancements of a research staff dedicated to formulating better cleaners for you.
6. DuBOIS SETS THE PACE providing the opportunity to unify all your purchases through one company. The result: greater dollar savings, improved service.

For Food Industry

Cleaners for equipment and utensils; smokehouses, lockers. Steam cleaning compounds, conveyor lubricants, degreasers and derusters . . . Acid and alkaline cleaners, detergents and non-detergents . . . Controls and dispensers. All food processing jobs!

DuBOIS CHEMICALS • CINCINNATI 2, OHIO

← CIRCLE 53 ON INQUIRY CARD

CIRCLE 54 ON INQUIRY CARD

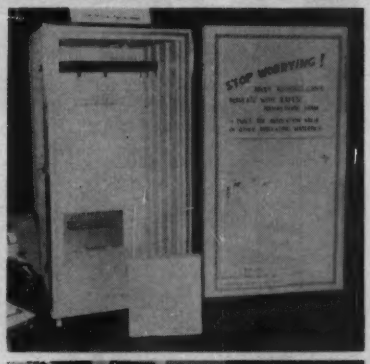
Packers-Show Attractions

Variety of packaging, processing and transportation equipment featured at Frozen Food Packers convention

ADAPTA-PAK packaging system handles new wrapperless, sealed cartons for frozen foods. Pattern-waxed carton is top-loaded and adapts to Kliklok units. — Container Corp. of America, Chicago. **(355)**

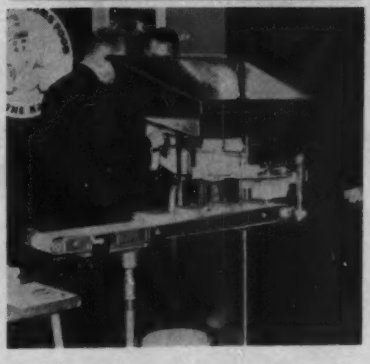
HEAD-SEAL "Captain" unit's sectional design can start with a semi-automatic machine and build up to a fully automatic line. Handles end-loaded packages for pies, etc.—Weyerhauser Co., Chicago. **(356)**

FILM PACKAGER has tubeless former for easy loading and simple bag size change-over; no tube bridging or product buildup.—General Packaging Equipment Co., Houston. **(357)**



INSULTAINER is adaptable to fit all refrigeration units. Polyurethane construction handles 52 cu. ft. of foods at AFDOUS code specs.—Raven Industries, Sioux Falls, S. D. **(358)**

KING-TUK 'CLOSEMATIC' packager locks, tucks, and glues cartons automatically. Unit is particularly adaptable to small packers.—Continental Can Co. **(359)**



ROTARY MEAT FORMER has lucite guard, continuous paper feeder, and simplified cleaning. Conveyor and automatic counter stacks and counts 1-10 patties.—Hollymatic Corp., Chicago. **(360)**

Other Show Highlights

DIRECT FREEZING system subjects food products to a temperature of —320F in minutes. Nitrogen in a liquid, gaseous, or spray form is exposed to raw, cooked, or packaged foods. Savings in time, space, and transportation are cited. —LiqueFreeze Corp. of America, NYC. **(361)**

IN-TRANSIT refrigeration system for perishables and frozens transported by multi-stop truck, "piggyback" system, trailer, or rail car utilizes liquid nitrogen as only refrigerant. Temperature maintained by spraying nitrogen (Polar-stream process) from a header mounted in roof of trailer.—Linde Co., NYC. **(362)**

FOIL CAN for frozen fruit juices has four layers: aluminum foil liner, two plies of kraft fibre, and outer foil layer. Cost saving: 20% less than conventional tinplate and 14% less than aluminum. Freight savings are also cited. Now used for Southern Sun concentrate cans.—R. C. Can Co., St. Louis. **(363)**

FLAVOR-FOIL process "packages flavor with food" via foil pre-coated with seasoning in a medium of shortening. Food wrapped and cooked in foil melts shortening and bastes product for correct seasoning. Inventor cites sales appeal and time-savings.—Morris Shorr, Canton, O. **(364)**

HERCULES

"BEEF-UP" YOUR REPEAT SALES WITH HVP-CENTURY

The initial sale is important but volume is built on repeats. That's why so many food processors are including Hercules HVP®-Century powdered in their formulations for the flavor of well-browned beef. It's a flavor that brings satisfied customers back to the counter again for "seconds."

HVP-Century, a total hydrolyzed vegetable protein derived from wheat protein, contains 100% of all the amino acids derived from the hydrolysis with none of the monosodium glutamate removed.

The latest addition to Hercules' full life of HVP powder and liquids and MSG, HVP-Century offers many possibilities for cost savings and processing advantages.

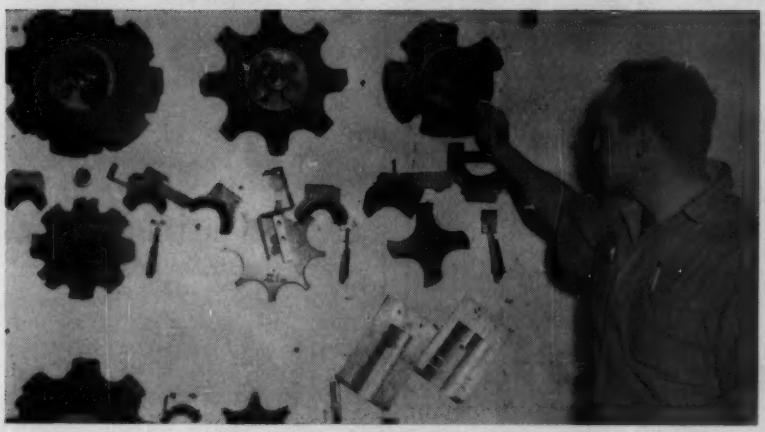
A four-page data sheet is available to provide complete specifications on HVP-Century as well as information on how to compute cost savings and convert formulations. A data sheet and a sample of HVP-Century, which has FDA acceptance for use in many applications, can be obtained by writing:

Huron Milling Division, Virginia Cellulose Department
HERCULES POWDER COMPANY
INCORPORATED
Hercules Tower, 910 Market Street, Wilmington 99, Delaware

practical ideas

Speeds labeler changeover

. . . Easy-off drive guard



Parts Board Speeds Labeler Changeover

Here's a simple system I've found indispensable for easy and speedy switching to different size glass containers on our labeling machines.

It's a labeling - machine - parts board that provides convenient storage of various changeover parts, also lets the maintenance crew see them at a glance. Formerly, we stored these parts in a cupboard and spent lots of valuable time hunting for mixed-up machine parts.

Our new parts board is made of ¾-in. plywood (4 x 4 ft.), and mounted on a wall adjacent to labeling machines. Secured to board are screw hooks that hold: (1) Container-transfer star-wheels (4- and 8-pocket), (2) sponge-rubber label compressors, (3) metal transfer hooks (transfer containers into starwheels), and (4) label plates (transfer labels from magazines to jars).—*Don Praught, Production Manager, Wm. Barnes, Inc., Minneapolis.*

Ideas Spoken, Not Written

Don't be stymied if your suggestion box collects nothing more practical than candy wrappers. Take a tip from Seabrook Blanching Corp., Edenton, N. C., and get your key people together once a week to engage in a free-wheeling man-to-man discussion of problems. Then you will come up with suggestions.

Seabrook's management assembles its principals—including a top executive, the "trick" chiefs, the shipping clerk and the maintenance man, every Friday. The discussion usually continues for about one hour, but it is terminated when ideas stop flowing.

This simple technique has paid off well at Seabrook.

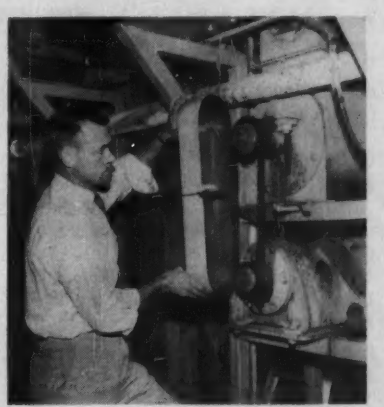
Although ridiculously simple, ideas can be valuable. At Seabrook, for example, it was suggested that rubber be put over the wire-mesh dryer belts to protect them from glancing hammer blows during screen - stapling operations. This saved appreciable damage, at practically no cost.

Many more good ideas — both larger and smaller—have come from the Seabrook Friday sessions.—*FE Staff.*

Stainless Racks Safest

Metal chips or particles, abraided from overhead racks made of soft or plated metals, often dropped into meat during reefer-truck transport.

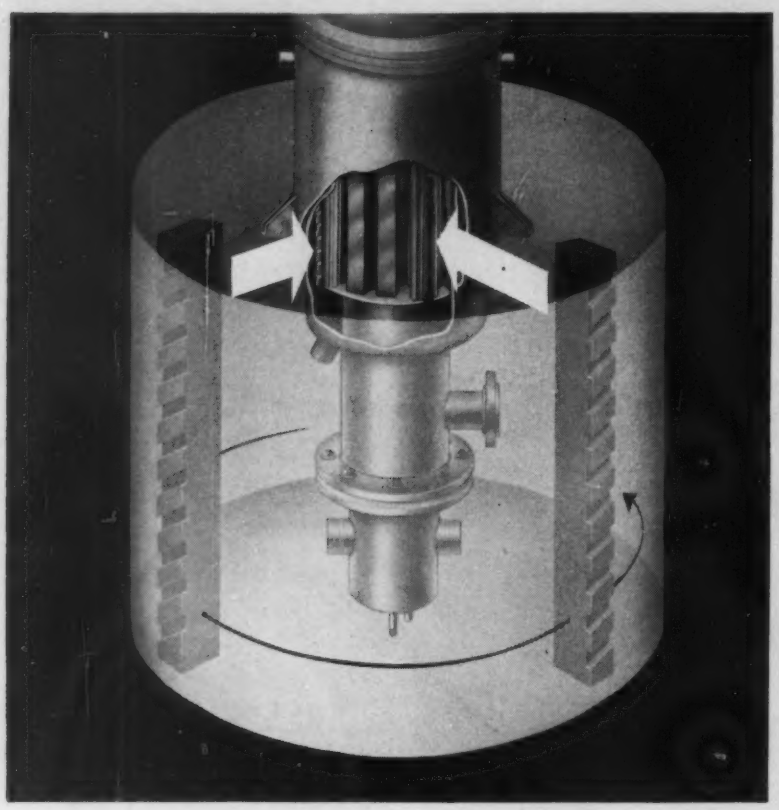
To obviate this hazard, Highway Trailer Co., Edgerton, Wis., equips its trailers with 1¾ in., stainless steel tubing (Wallingford Steel Co.). Some 240 ft. of tubing, anchored to the roof by stainless hangers are used.



Drive Guard Snaps On-Off

Conventional drive guards take time to remove and replace. Yet good maintenance practice requires that they be removed frequently for inspection and lubrication of sprockets and chains. Moreover,

FLUIDICS* AT WORK



How a "wiped" evaporator surface protects food flavor

These variable-speed controlled "wipers" are unique to the Pfaudler® Wiped Film Evaporator. They wet the *entire* evaporator wall with a thin, uniform film.

Your food product is exposed to heat for an absolute minimum of time. No burn-on. No product degradation. No loss of flavor. So important when evaporating *heat-sensitive* or *highly viscous* foods.

Four wipers are provided in the Pfaudler evaporator. They are free-floating and held in contact with the evaporator wall by centrifugal force of an internal rotor. The slots in each wiper *prevent* product curl and help accelerate product movement down and off the heated wall.

This gives you the best combination for full utilization of heat transfer area, an *ultra-thin* film for high "U" values, and very short contact time at elevated temperatures.

The Pfaudler Wiped Film Evaporator is a high-capacity production unit that can provide an output of up to 50 lbs./hr./sq. ft. of evaporator area.

Choose from standard models with 4 to 100 sq. ft. of evaporating area. Larger sizes are available on a custom basis.

Test your product *first* in the Pfaudler Test Center. More data found in Bulletin 991.

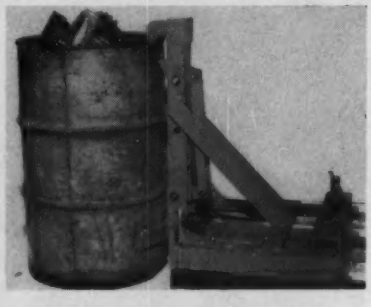
Write to our Pfaudler Division, Dept. FE-41, Rochester 3, New York.

*FLUIDICS is the Pfaudler Permutit program that integrates knowledge, equipment and experience in solving problems involving fluids.

PFAUDLER PERMUTIT INC.
Specialists in FLUIDICS . . . the science of fluid processes

guards must be replaced promptly or moving parts are left exposed and a safety hazard.

A practical solution is this boltless, quick-detachable guard which can be removed and replaced in seconds. Savings at our plant alone will amount to $600 a year, but more important, the guard's ease of handling encourages proper safety and maintenance practices. *—J. Burgess, Maintenance Dept., Carnation Co., Oakland, Calif.*



Easy Way to Handle Open-Head Drums

For easier and safer handling of 55-gal. open-head drums, this unit slips on the forks of any lift truck in seconds. Driver need never leave his seat to handle drums.

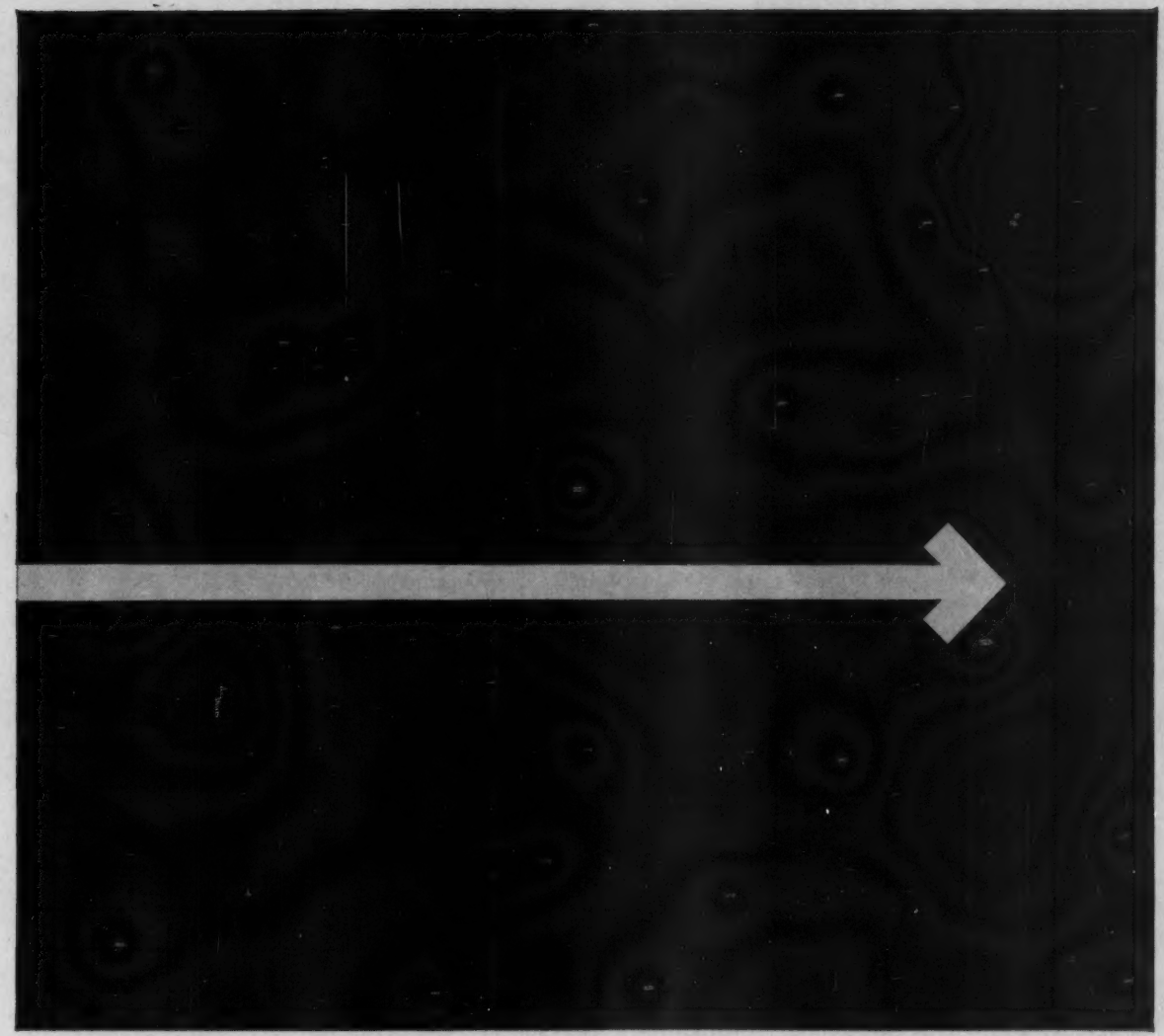
Gripping head consists of a hook and jaw that automatically grip a drum a few inches below the rim. A support plate at base of attachment activates the gripping jaw. Loads are released only when drums have been set down.

Called Drumaster, unit has 2,000-lb. capacity and is made by *Little Giant Products, Inc., 1530 N. E. Adams St., Peoria, Ill.*

Steam Leaks Are Costly

A continuous ¼-in. steam leak could cost you $3,500 per year. If, for example, the diameter of the leaking aperture is ¼ in., fuel cost $6 per ton, and steam pressure is 320 psia., the loss will amount to $9.60 per day.

Here's how to compute the cost of such a leak: Square the diameter of the opening in inches, multiply by the absolute steam pressure in psi., then by the cost of fuel per ton in dollars, and then by 0.08. Result is the cost per day in dollars. In developing the above rule, it was assumed that 1 lb. of fuel will evaporate 6 lb. of steam. *—W. F. Schaphorst, M. E., Newark, N. J.*



ONE CONSTANT IN THE FOOD PROCESSING EQUATION:

MORTON '999' SALT = UNVARYING QUALITY

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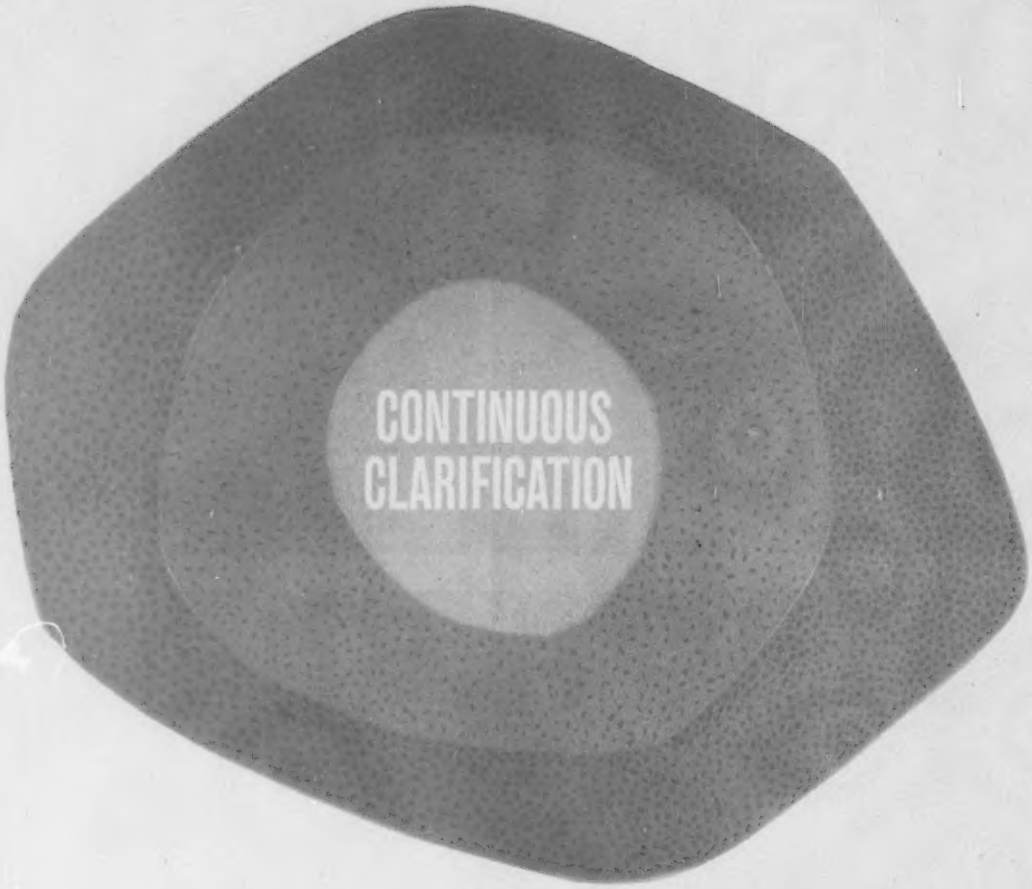

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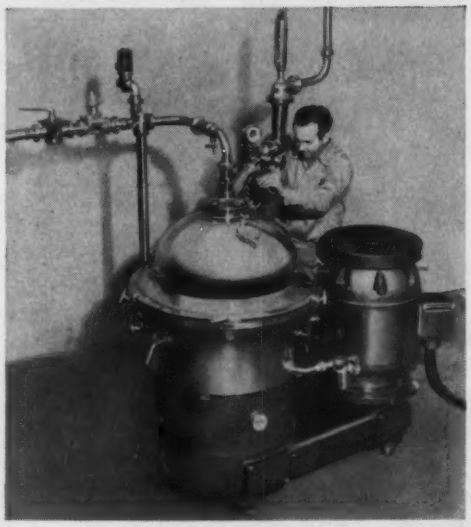


Used to control pulp solids concentration in orange juice, "Big Sam" Automatic De-Sludger in all-sanitary design (Model SAMN-15037) has found wide acceptance in Florida citrus industry. Similar installation is part of unique orange juice processing system developed by Minute Maid Company now in operation at Minute Maid's Plymouth and Leesburg, Fla. plants.

See us at the Institute of Food Technologists annual meeting, Hotel Statler Hilton, New York, May 7-10.

Doing It Better

MULTIWALL BAGS of extensible paper withstand rough handling.

RATH PACKING CO.

Cuts Bag Breakage

Use of multiwall bags of extensible paper for its animal feed and fertilizer has cut breakage some 10% at Rath Packing Co., Waterloo, Iowa. Moreover, bags cost about 7% less than comparable packaging because their greater toughness enables use of lighter-weight paper in manufacture.

As shown, Rath uses carts for loading bagged products on trucks. The bottom bag of a stack gets rough handling during loading and unloading of the cart. However, the bags of extensible paper (Clupak) are designed to stretch rather than rupture upon initial impact, thus take greater punishment without breaking.

The extensible paper is made by a process developed by Clupak, Inc., New York City. (201)

STAYTON CANNING CO.

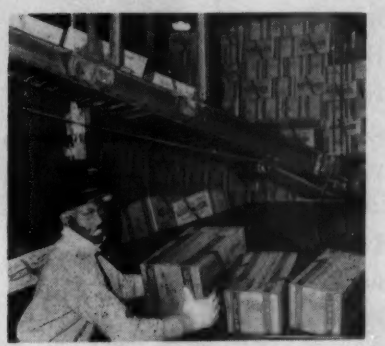
Ups Grading Efficiency

Green-colored rubber conveyor belts speed corn grading at Stayton Canning Co., Stayton, Ore. Furthermore, they cut labor, maintenance, and replacement costs.

Belts ranging 8-30 in. wide have been used on wet cut-corn lines handling some 11 million lb. a season. Grading is faster and easier because the corn's various yellow shades are more pronounced against the green background.

The belting does not absorb water, and no stretching or shrinkage adjustments have been required. Per 1,000 ft. of belt, there is a saving of 24 man-hr. a week in cleaning time. Belts are hosed three times a day, and scrubbed at the end of each season.

Known as "Green Pack," belting is supplied by B. F. Goodrich Industrial Products Co., Akron, Ohio. (202)



CONICAL TURNTABLE speeds sorting and subsequent palletizing of mixed varieties of product.

GOLDEN GRAIN MACARONI CO.

Speeds Case Handling

Palletizing of multi-size cartons with the aid of this turntable has upped handling efficiency at Golden Grain Macaroni Co., San Leandro, Calif.

The conical unit handles up to 600 mixed cartons per hr. It is 2 ft. deep and 12 ft. in diameter (side slope 18 deg.). Cases conveyed from a sealer are deposited at top of cone, and slide down to the outer edges. Circling the cone is a ½-in. retaining pipe.

An operator removes cartons as they reach the edge of the revolving cone and places them on pallets according to size and type. He stands in one spot and loads one or two pallets at a time. When these are filled he moves to another spot and loads other pallets. Meanwhile, a fork truck carries filled pallets away and replaces them with empty pallets without interfering with the operator at the turntable.

The table makes two revolutions per min., thus the outer edge moves at 76 fpm. Power is transmitted from a 1-hp. motor by a 4 x 8 four-ply pneumatic tire. Supported by eleven 3½ x 3 in. rollers, unit handles cartons up to 17½ x 11¾ x 8⅝ in. and weighing up to 25 lb.

Conveying equipment was installed by Mathews Conveyor Co., San Carlos, Calif. (203)

BLUE BIRD BAKING CO.

Improves Pie Coating

Coating of pies by vibratory feeder makes them look, pack, and sell better, according to Blue Bird Baking Co., Dayton, Ohio. Moreover, it has saved coating material and 4-5 man-hr. per day.

Unit showers some 10,000 pies daily with automatically measured amounts of toasted shredded coconut, chocolate decorettes, or butterscotch bits. Formerly pies were hand-coated by sifter, but coverage was uneven. And irregularly coated goods tend to stick to cellophane wrappings.

Feeder is located over the pie conveyor. A simple control under the belt regulates flow of various coatings to different size pies. In operation, the feeder's electromagnetic action moves an attached feeding tray forward and upward 3,600 times per min. to dispense the coating, which falls on the pies moving below. Any excess falls into a recovery bin for re-use.

The vibratory feeder, called Hi-Vi, is supplied by Eriez Mfg. Co., Erie, Pa. (204)

Gardner Baking Co., Madison, Wis., now wraps over 65% of its bread in polyethylene film—the result of surging consumer demand and reduced returns. Company personnel were trained in use of necessary heat-sealing equipment by film supplier, U. S. Industrial Chemicals Co., N. Y. C. (205)

Rose Packing Co., Chicago, has cut material-handling and shipping costs by switching to a corrugated bulk-shipping container for its loaf-style ham. Made by Stone Container Corp., Chicago, unit holds 800 lb. of meat and provides superior product protection. (206)

FREEZE DRYING

D&O offers SPISOSEAL the latest development in seasonings for foods of the future. SPISOSEALS are extractions of natural spices, spray dried for absolute flavor stability and unsurpassable shelf life. Full, instant release of flavor, aroma and strength . . . highly recommended for freeze dried foods. Write the D&O Dry Materials Division, 249 Goffle Road, Hawthorne, N. J., for detailed information.

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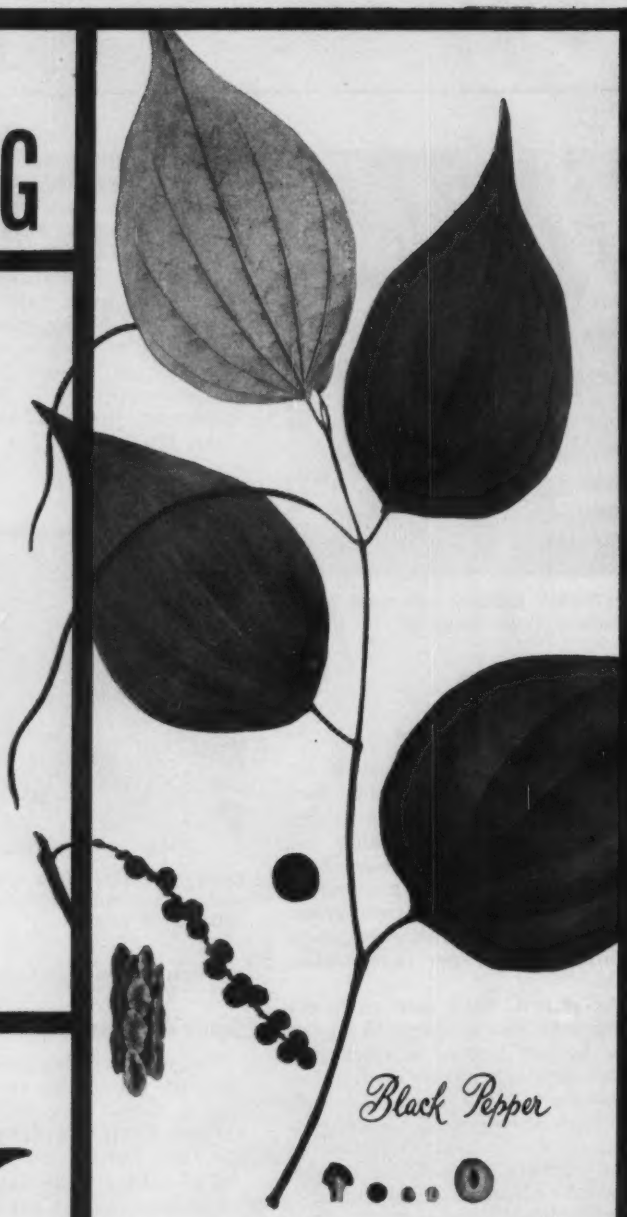

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AND SEASONINGS

Sifters, Screens, Graders, Reels, Centrifuges, Classifiers . . .

. . . they come in many types, but only one is best for your particular application. Here are design, operating, and maintenance data for these latest cost-cutting units

RECENT ADVANCES in separation equipment have upped operating efficiency and product quality—while cutting the cost of this basic unit operation materially.

For example, latest classifiers have given millers much better control of particle-size uniformity. Thus they now offer new types of flour with chemical and physical properties vastly superior to those attained by conventional milling. Furthermore, the new technique cuts repetitive handling of stocks, saves space, and improves sanitation.

Similar gains have been chalked up in many other branches of the food industry.

This report covers separation of dry solids primarily, including the grading of fruits and vegetables and some dewatering operations. Not included, however, are separation by filtration (see FE, July '60, p. 49), wet cyclones, or thickeners.

FE Staff

Sifters: Construction, Operation

Operating continuously, sifters expose dry particles to numerous screen openings to effect two to eight size separations.

In general, sifting is accomplished by three types of motion—gyratory, reciprocating, or gyratory-reciprocating.

1. **Gyratory.** Material moves in a circular path while advancing because of the screen's pitch. Circular travel exposes particles to some 150% more openings than reciprocating motion, 44% more than the combination motion. Gentle action minimizes product disintegration.

2. **Reciprocating.** Product moves in a straight line as inclined screens travel back and forth. This provides virtually continuous flow.

3. **Gyratory-Reciprocating.** Screens have spiral motion at feed end that becomes reciprocating toward the discharge. Material initially follows a near-circular path that becomes elliptical. (Turn Page)

SOLIDS SEPARATION

Materials of construction. Screens come in brass, phosphor bronze, steel, stainless steel, monel, alloys, silk, or nylon. Silk or nylon occasionally are preferred when mechanical blinding is a particular problem. Some screens operate over a 2- to 200-mesh range, others only in the coarse-mesh range. Still others handle several products like sugar, flour, and nut meats in the same unit.

Screen capacity. This, of course, varies with design characteristics and nature of material handled. For example, a gyratory 4-screen deck (16-mesh) sifts about 500 lb. of flour/min. Adding one or two decks jumps output to 550-600 lb. Using a finer mesh (50) for 5 or 6 deckers drops production to 200-300 lb./min.

Some six-deckers handle 100 lb. of powdered coffee/min., 250 lb. of granulated sugar, and 165 lb. of corn starch.

In-line setups. Sifters have a variety of feed and discharge systems. Typical are pneumatic feed and discharge, elevator-feed and conveyor - discharge spouts, feed hopper and discharge conveyor (scroll), and feed and discharge conveyors (scrolls).

Size classification. A 7-sieve unit handling four product sizes, for instance, has sieves arranged in stacks of 2-2-3. Two upper sieves having coarsest clothing discharge their 'overs' as first product size. Thrus tumble onto sieves 3 and 4 for 2nd-size discharge. Again thrus continue over sieves 5, 6 and 7 to produce 3rd and 4th (fines) sizes.

Self-cleaning. One manufacturer's gyrator sieves have two surfaces—an upper sifting cloth and lower pan or sheet-metal surface that catches thrus for diverting to outlet.

Cleaners ride on a wire screen between both surfaces to provide a self-cleansing action. Screen's motion keeps cleaners in constant contact with underside of sifting cloth and, thereby, keeps latter's mesh open.

Efficiency Factors

Your biggest screening problem is blinding — accumulation of material on wires.

In extreme cases, materials can't pass through the openings. Partial blinding reduces available screen area, requires reducing the feed rate. In any case, blinding is caused by unfavorable product or screening characteristics.

Rate at which particles pass through a screen opening is markedly influenced by: Product density, shape, moisture and fat con tents, screen analysis, special bolting characteristics, and static electricity.

► **Product**—Its physical and chemical nature governs rate of sifting. For example, salt and sugar are similar in appearance, and that's all. Salt pits a metal screen more readily than sugar. Passage of salt crystals soon slows considerably with increasing friction.

► **Density**—Sifters handle materials ranging from a few to a little over 100 lb./cu. ft. Heavier materials pass through sieves faster than lighter ones, but tend to stretch bolting cloth. Excessive amounts also press down on sieve-cleaning balls to obstruct their action. Suggested practice is to feed only a thin layer of heavy material over sieve cloth.

► **Shape**—Slivery or slabby materials, whether wet or bone dry, also cause trouble. They wedge into openings so tightly that screen vibrations can't toss them out. Wedge-shaped particles entering openings spread the wires which, because of their spring action, exert more force on the trapped particles.

In some cases, elongated particles that aren't wedged in openings can't be thrown out. They may eventually wear down and pass through but, if they are hard and abrasive, steps should be taken to prevent blinding and screen wear.

Further, more force is needed to toss elongated particles out of screen openings than cubical ones. It's obtained by increasing speed or amplitude of vibration (the more effective way).

► **Moisture**—Dry free - flowing products usually pass through silk or wire screens far more readily than those with high moisture content. Confectioner's molding starch, for instance, is easily sifted when fat and moisture contents are low. If high, sifting rate is reduced.

Too-moist products tend to blind a screen. Blinding, however, varies with moisture content of different products. For salt, moisture shouldn't run over ½%. Yet, screens can handle other products with far higher moistures—15-18% for flour and 45-60% for bagasse.

Moisture - induced blinding is most troublesome with screen openings up to ⅜ in. Moisture causes fines to cling to one an-

GYRATORY SIFTERS in National Biscuit Co.'s Fairlawn, N. J., plant feature easily accessible all-metal construction. Sanitary-type sifters contain six vertically stacked screen cloths offering 30 sq. ft. of screening area.

other and to screen's wires. Trouble is sometimes overcome (or alleviated) by using wire cloths with openings that are rectangular rather than square. If this doesn't work, fines must be dried (electrically heated during screening) or knocked off screen surface by impact. When the problem arises only occasionally, periodic brushing of screen or striking with a rubber hose suffices.

► **Fat**—Oil-containing products are another source of trouble because they are not free-flowing. The high oil content of nut meats requires use of oil-impervious sieve cleaners. Conventional rubber-ball cleaners aren't suitable because they increase in size when absorbing oil. Only a small increase in balls' diameter can be tolerated because of limited space between screen and cleaner wire. Used, instead, are 1-in. plastic balls, with Neoprene rubber seals inside sifter box, between sieves.

► **Screen analysis**—Relative size of particles and screen openings are also major factors determining capacity. If openings are twice as large as particles, screening, of course, is faster than if holes are smaller. That's why screen analysis of materials is helpful in determining capacities —especially for dry, free-flowing products without unusual bolting characteristics.

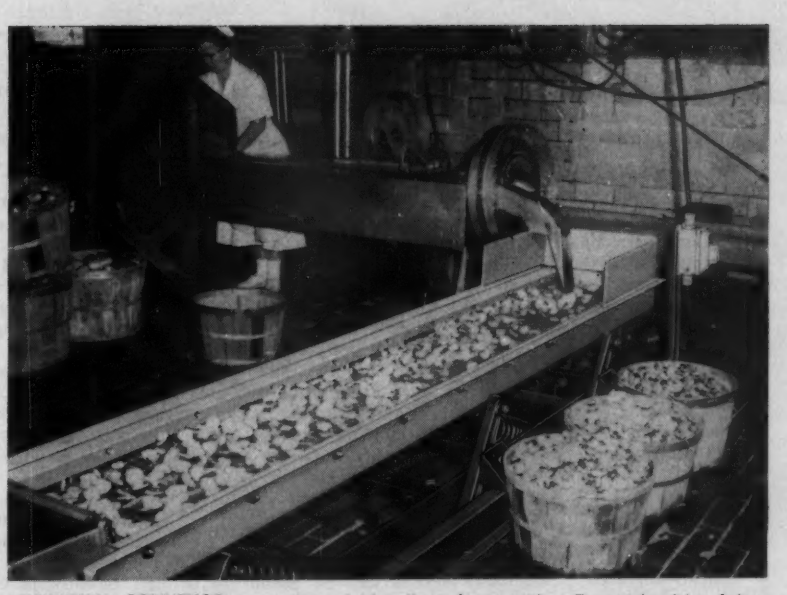
► **Special bolting**—Product size reduction also has a bearing on screen capacity. Particles ground in a hammermill are of different shape than those processed in a roller mill. Result is that differently shaped particles of same product have different bolting characteristics.

► **Static electricity** — Cohesive force resulting from static electricity is sometimes strong enough to prevent passage of particles through screens. Products that show a marked tendency to develop static charges can't be satisfactorily sifted.

For Special Problems

Here are screen accessories for difficult or unusual jobs like handling moist and sticky products as well as 'on size' or 'near size' materials.

. . . **Bouncing ball decks** are used when problems of moisture and particle size are encountered. Particles may be continuously dislodged by a coarse retaining rod deck mounted directly below the screen deck.



VIBRATING CONVEYOR separates pickle slices from ends. Eccentric drive introduces vibrations as slices are conveyed along screen deck.

. . . **Heated screens** prevent cloth from blinding when handling sticky or hygroscopic materials. Heating is accomplished by passing low-voltage current through screen surface.

. . . **Special screen surfaces** eliminate blinding of large openings with sticky materials. Large slotted openings provide more open area, hence less sticky material can collect on them.

. . . **Controls, such as mechanical snubbers** or electrical plugging monitors, eliminate excessive screen motion during start-stops by avoiding critical vibrations in the resonance-speed range.

Vibrating Screens

There are two major types of vibrating screen — inclined and horizontal.

Products and operating conditions vary, hence screens of different type and size are used. Where dust is a problem, total enclosures are furnished. Otherwise, screens are open. For handling corrosive materials, exposed parts are of stainless steel.

Vibrating screens comprise a box (for attaching screen surface), vibrating mechanism, and means of mounting screen to isolate vibrations from supporting structure.

Inclined screens gravity-convey materials, to which a circular motion is imparted. Horizontally operated screens' straightline motion (generally 45 deg. to deck's plane) creates forces that both convey material along and lift it above deck.

How Built. Units have single-, double-, or triple-screening decks, with open or enclosed areas. Sizes range 2x4 to 6x16 ft., and screening elements vary from grizzly bars to 120-mesh. Screen cloths have square, rectangular, or slotted weaves.

Screens are also built with perforated plates containing round, square, or slotted holes. Grizzly deck bars are employed for high-capacity operations involving handling of screen-adhering moist materials.

Elliptical motion. One type of inclined screen consists of screen box and a two-bearing, off-center, weight-vibrating mechanism attached to top side of box. Open or enclosed varieties are either floor-mounted or suspended from an overhead structure. Screens handle any type of lump or granular material not over 4-in.

Maximum screen deck openings are 1½ in. (perforated plates). The minimum (for dry screening) is about 20-mesh wire cloth.

This type is used for fine sizing, wet or dry.

Circular motion. Another type consists of a screen box and a two-bearing, balanced-eccentric-type mechanism that is located at the center of gravity to describe a circular motion. Screen decks contain either wedge wire, perforated plate, or woven wire cloth. These screens are also built with

Check These Prime Pointers for Optimum Screen Performance

Vibrating screens undergo severe service, thus must be readily accessible for lubrication, maintenance, and changing of screen surfaces.

▸ **Installation.** Feed-and discharge-end springs must be compressed equally. Supports for floor-mounted screen's spring bases have to be level and in line, otherwise springs will be unevenly loaded.

▸ **Start-stops.** Belt drives have to be properly aligned, with tension springs tightened for proper belt tension and for stabilizing the screen longitudinally. Friction checks stabilize screens in a transverse direction, also snub motion during starting and stopping. Smoother stopping is also achieved with a reversing-type starter that shortens stopping cycle and prevents buildup motion. Whipping of cable-suspended screens can be checked by clamping stabilizer block to cable.

▸ **Feeds.** Hold velocity of spout-fed material to a minimum so as to check wearing of screen's surface and assure efficient separation. It can be done by feeding material parallel to longitudinal axis of screen.

▸ **Replacements.** Worn sections of screen cloth can be quickly replaced if discharge spouts can be easily removed. If you use cable-suspended screens, have enough room so you can raise discharge end of screen for easy changing of worn screen surfaces on multiple deckers. This can be done with hinged-type discharge spouts that move out of way of screens to be raised.

▸ **Checking.** After replacing worn screen-cloth sections, periodically check cloth tension by using compression springs during first day's operation. Then continue checking until all stretch is taken up. Improperly tensioned cloth will whip and break. Also replace worn buffer strips between cloth and longitudinal bars so cloth is properly supported. In the same way, periodically check bolts for tightness until they are firmly seated.

▸ **Lubing.** Vibrating mechanism's bearings must be inspected for signs of fatigue spalling, flaking, improper lubrication, contamination wear or abrasion, pitting, or corrosion. To get longer life from bearings, make sure dust seals are kept in good condition. Follow lubrication instructions and use the right type of lubricant. Use of too heavy a lubricant in cold weather (if screen is outside) results in tardy lubrication, also causes scoring and galling of races. Lighter lubricants are best for screens employing cold-water sprays to wash product.

Grease-lubricated units call for adding a small amount of grease to each bearing every day. For oil-lubricating jobs, oil must be changed every 300 hr. of screen operation and oil levels checked.

Recommended is the practice of maintaining spares—bearings, seal plates, surface screens, tension plates (for cloth), spacing collars, etc.

rod-type deck comprising parallel rods suitable for scalping.

Unit is used for light scalping, coarse to fine sizing (wet or dry), and rinsing.

Straightline motion. Still another unit has a screen body with vibrating mechanism consisting of vibrator bar attached to a reaction member and screen body by push rods. A rectifier actuates two electromagnets, thus screen body is alternately pushed and pulled in straightline motion at 3,600 vibrations/min.

For dry screening, apertures range ⅛ in. down to 35 mesh. The rectifier has taps that vary the amount of vibration. Also, a timer automatically increases the amplitude on a preset cycle. This type is used for coarse to fine sizing, wet or dry.

Space-saver. Low-head horizontal vibrating screens consist of screen body with 45-deg. vibrating mechanism attached to its upper side to impart straightline motion. Vibrator has two parallel shafts geared together, each equipped with off-center weights timed to alternately oppose and assist one another. Types are available for dry screening (from ⅛ to 2½ in.) and for wet screening (openings down to ¼ mm.). They are supplied with wire cloth or perforated plate surfaces.

Maintenance-reducer. Employing a new principle of vibration—high-intensity motion with independently-driven vibrator shafts to step up screen performance and reduce maintenance—is another advanced screening unit. Two unbalanced shafts are automatically synchronized, since they are driven in opposite directions by their own pancake motors.

Absence of gears or intershaft couplings eliminates wear and maintenance problems. In addition, unit's shorter V-belt reduces whip, slip, and wear; lessens starting torque; and makes full use of motor horsepower.

Vibrating Conveyors

To extend their versatility, vibrating screens also convey materials as they are screened.

Operating at 1,000-2,000 rpm. with ⅛ to 1/32-in. strokes, they size and separate materials by:

(1) Conveying to uncover openings so liquids and undersize materials pass through.

(2) Evenly distributing product flow.

(3) Agitating materials to permit liquids and fine materials to work through larger-sized materials and openings.

(4) Dislodging particles wedged in openings.

(5) Detaining materials long enough for efficient separation.

The screen is mounted on a shaft turning on bearings, with unbalanced weights keyed to or machined into shaft. Screen follows path of vibrating weights. Placing vibrator on top of screen box creates a slight rocking action that results in elliptical motion (ellipse leans toward vibrator). As a result, materials move faster away from feed end and are retarded at discharge.

Most screens have a cloth pulled across a longitudinal steel member equipped with rubber caps. Cloth changing is easily accomplished by loosening tension bolts and sliding cloth out of either end. Vibrating of supports is prevented by mounting the screen box on springs or rubber blocks.

Operating Variables

Vibrating screens differ in their adjustability. All, however, can be modified by varying the feed rate, speed, vibration amplitude and deck slope to suit specific operations.

Feed gate is opened to a point just below that at which screen surface is overloaded. With uphill operating screens, it's easy to see the point where overloading occurs. Down-hill operating screens, however, require judgment in proper adjustment of feed rate.

Speed is critical in most operations for regulating passage of material across deck, and in sepa-

rating solids efficiently. Typical vibrators (mechanical type) range 900-1,700 rpm.

Amplitude affects speed of travel and, in cases involving dewatering, dryness of solids. Increasing the amplitude of motion ups material speed across the deck.

Deck slope governs the time material has to pass over the screen deck. A steep slope gives rapid flow, while a lesser slope provides more separation time for a better job.

Typical Applications

Here are some of the jobs vibrating screens are doing in the food industry:

► **French fries.** Spuds are conveyed from shaker-graders that size-grade the potato strips, separating slivers and 'shorts' for subsequent delivery to dicing machines for hash-brown products. A vibrating conveyor agitates the product as heated air is drawn downward through the strips. Heat and air velocity remove excess frying oil.

► **Pickles.** A vibrating conveyor efficiently culls 'ends' and seeds (7% of each pickle) from pickle slices to cut inspection costs. Output is 300-bu./hr.

Screen deck is vibrated by an eccentric drive that moves along the deck. Undersize pieces fall through and onto flat-bottom trough for disposal. By simple change of screen decks, almost any sliced product can be handled by separator.

► **Corn.** Kernels drop on vibrating screens for removal of hearts (broken kernels) and dewatering. Good kernels are water-jetted into rotary screen reels. Further along, other vibrating conveyors dewater blanched corn as well as remove solids from cannery waste.

► **Shellfish.** Stainless-steel vibrating conveyors, with perforations alternately varied in size, continuously grade peeled, deveined, and blanched shrimp. Similar screens dewater fish pumped from trawlers.

► **Tomatoes.** Waste in tomato canneries is sluiced onto four vibrating screens. First handles pomace from chili sauce and ketchup products. Other three take care of culls (skins, cores, and rejected tomatoes).

► **Other uses.** Vibrating screens recover paunch manure from meat-packing plant waste water, screen out solids in plant wastes, and separate press liquors from cooked fish. They are also used in separations involving beet sugar juice and pulp, tomato seeds, pumpkin waste, fruit juices, and coffee grounds.

Classifiers

Classification systems have long been used to separate fine particles from air. Now they have been refined for separations as coarse as 100 mesh, or as fine as several microns in special cases.

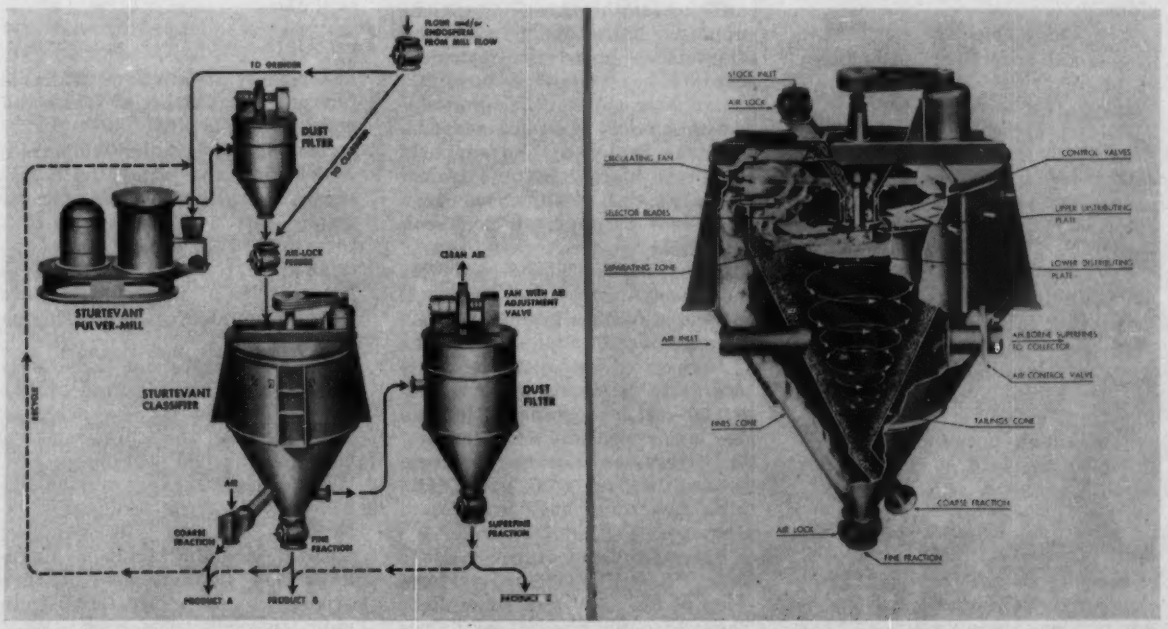
A particularly successful application is classification in closed circuit grinding, especially where grinding to fine size is required as in flour mills, sugar refineries, cocoa plants and spice mills.

Closed-system classifying can be applied to any reduction unit to take advantage of special characteristics it may have. Sub-sieve grinding of drys usually requires air classification of ground materials.

Some products can't be reduced economically in a single step. Power requirements might be impractical, production rate low, or temperature buildup great enough to carmelize sugars or coagulate proteins. It is then more practical to grind coarse, classify to usable materials, and recycle oversize in a closed system.

Here's a rundown on several advanced systems:

1. **Combination impact pulver-**



ADVANCED REFINING SYSTEM (left) separates coarse, fine, and superfine flour fractions. Special low-micron separation permits effective starch-protein shifting for production of tailor-made flours. Air classifier (right), used in conjunction with pulverizer, achieves selective separation by precise control of air velocity and centrifugal force.

VIBRATING SCREEN, conveying pickle slices, upgrades product quality by removing undesirable end cuts.

izer and internal air classifier for lower micron-range grinding. Product is screw-conveyed to grinding chamber, where hammers reduce to size. Classifier blades on hammer shaft return oversize material, as properly sized particles pass to cyclone.

2. **Closed-system grinder** produces varying degrees of fineness. Product is air-conveyed to a chamber, where rotating blades grind and discharge it to classifier. Proper size materials go to cyclone.

3. **A high-velocity air-current system** for continuous production of bread crumbs features a pulverizer (air-attrition type with 2,000-cfm. cyclone), classifier, and exhauster. An adjustable reciprocating feeder charges bread into pulverizer as level of bed under rotor is maintained by hydraulic feeder.

4. **Various size materials** emerge as a single-size final product by processing in an air-attrition, impact pulverizer with radial, inward air classifier employing centrifugal force. System is used for blending, grinding, and classifying of sugar, cocoa powder, and milk solids into a hard-butter coating.

Rotary Reels

In suitable applications, rotary reels may be found almost anywhere along canning lines. They can handle large tonnages continuously, with minimum floor space, cost, and power.

Units contain motor-driven revolving drums (perforated or rod-type) of varying diameters, lengths, and capacities for washing, grading, and draining. They are available in single or dual-drum arrangements, with practically any sieve size. Sizing reels may also be divided into several grading sections, usually up to three. Some self-contained units have a large hopper and adjustable continuous feeding elevator.

Also available are: (1) Shaft-supported units for dry screening of relatively small size materials that are not restricted by unit's spider arm, and (2) roller-supported screens with main frame (open at feed end) and supports for screen plates. Latter's frame-discharge end is supported by a stub shaft through which screen is driven.

Here are several uses of this equipment:

► **Beans.** With a typical dual arrangement, cut and whole beans are separated into 2-5 sizes (according to diameter) at capacities to 1,500 lb./hr. Single units even size beans according to length.

► **Mushrooms.** Rotary reels (perforated or rod-type) grade and wash mushroom buttons for canning.

Those handling flumed buttons have 1¼ in. and ⅛-in. perforations at feed and discharge ends. Then, through a series of flumes and conveyors, buttons find their way to an underwater rotary-reel grader for mechanical separation into several sizes.

► **Beets.** Similarly size-graded are beets for canning. After passing through rotary pre-grading tumblers, product selected for a whole-beet pack is routed to a continuous peeler and rotary tumbler that grades it into five sizes. For slice packs, over-size beets proceed to another rotary reel that separates them into four sizes.

► **Oysters.** Reel-type washers equipped with water sprays separate blanched oysters from their shells. Meats discharged onto a vibrating-type wire-mesh conveyor are further separated from small shell pieces.

► **Still others.** Rotary reels are used to size a host of other products like beans, cut string beans, cherries, carrots (to eliminate slivers), tomatoes, and potatoes.

They also separate seeds liberated from paprika meats, with latter discharged onto belt for final removal of stems, leaves, etc.

Electrostatic Grain Cleaner

This system handles a variety of grains discharged in a continuous layer from feed hopper across a chute that delivers them to an electrostatic field. Separation is achieved by difference in degree of repulsion from charged particles.

Least-repelled material (grain) is isolated from most-repelled particles (impurities) by adjustable splitter.

Graders

A variety of units are available for continuous sizing of fruits and vegetables. Typical units:

Spool-type grader comprises shaker feed and sizing units that separate fruits (apricots, for example) into five sizes at up to 7 tons/hr. Fruit is uniformly distributed across the sizer, which has a series of revolving concave spools mounted side-by-side on shafts.

Unit first takes out three sizes of smallest fruit, followed by two large sizes. It is also designed for re-sizing the three smaller sizes in a second section.

Roller sizer employs moving size rollers that form gradually expanding pockets. In handling lemons, incoming fruit is singulated on a sloping conveyor, then oriented to drop into unit's individual pockets.

As rollers progress along grader's frame, their interstices (val-

leys) expand to enlarge the pockets. Smallest fruits drop through first, then larger product as interstices widen. Conveyors below grader catch the five sizes and route them to packing stations.

Grading Nut Meats

A West Coast walnut firm's operations involve:

Routing nuts from crackers to scalpers that separate nut meats from broken shells, with meats falling into rotating spiral-type size graders. Small size meats and shell pieces drop onto a conveyor feeding a shaker-separator, while larger pieces discharged onto another belt are routed to air separators. Uncracked stock falls on still another belt for cracking.

Cracked stock is then size-graded by additional scalpers and spiral graders. Fines are conveyed to a shaker-separator, while remainder, according to size, is removed to air separator or returned for re-cracking.

In a subsequent 4-step separation, stock is vibrator-fed to a triple-duct air separator in which meats cascade across screens. Nut meats fall onto a spiral-screw size grader for dividing into halves and pieces. Shells and fiber (with meats) are dumped from cyclones onto a conveyor that discharges onto shaker screens. Latter separate into three sizes.

The two larger sizes proceed to the Armstrong process (wet separation), or part of the stream may be diverted to a secondary air separator. Smallest size (fibers and shells) are conveyed through an oil mill and burnt in the plant boiler. Meats are finally charged into a photoelectric color sorter.

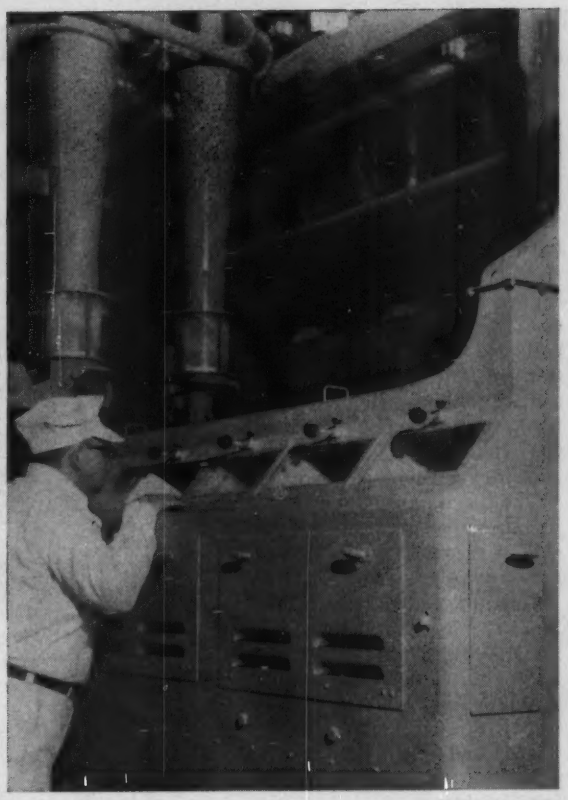
Raisins, Too

An automatic air-sorting unit developed by USDA's Agricultural Marketing Service separates immature raisins from those meeting Federal standards. Moreover, it does it faster and more accurately than can be done by hand.

In operation, a controlled air stream blows the lightweight, immature raisins and vine trash into a special container. Heavier, meatier raisins drop into another receptacle. The machine can be adjusted to separate product into A, B, and C maturity classes.

Centrifugal Separation

A recent centrifuge development that promises widespread application is processing of whole fruits and vegetables to remove skins, seeds, pits, and extraneous matter.



DOUBLE-DECK PURIFIER has independent air control for each screen-deck area. Air flow (1,200-1,500 cfm.) through decks is sectionally controlled to coincide with screen-mesh areas.

With pears, for example, product is cooked and passed through a hammermill for light crushing, then pumped into the centrifuge (Sharples' Conejector).

Centrifugal force accelerates the mass toward the bowl wall, where pear puree passes through a screen and into the liquid outlet. Pomace is conveyed down the screen and discharged through a chute by a differential volute that does not touch the screen wall. The volute retains pomace in the centrifugal field and exerts gentle squeezing for optimum dryness.

Choice of screen is dictated by several factors. A screen with small openings would be used to eliminate fine particles of skin imperfections and/or dirt from the finished puree. However, screen openings should be sufficiently large to permit proper drainage of pomace from puree. In addition, screen openings may vary in shape from slots to triangular or circular openings according to product characteristics.

Another centrifuge (Mercone), handling disintegrated whole apples, separates pomace and juice efficiently. Moreover, it removes sufficient pectin from the juice to eliminate the conventional treatment with a pectin-decomposing enzyme (FE Feb. '60, p. 71).

Mill-Product Separation

Some plants couldn't operate without one type of solids separator or another. Others, like flour mills, must repeatedly size-reduce and size-separate their products. Required here are a variety of solids separators, each to do a special job.

Replacement of conventional roller mills by impact pulverizers has simplified and sped flour milling. And there is less capital investment. Also, centrifugal classifiers used in conjunction with pulverizers are economically milling flour to customer specifications, despite mill's location in weak or strong wheat areas. (Turn page)

Precise selection of end products is made by control of air currents and centrifugal force. Sturtevant's impact mill with integrated air classifier operates at capacities up to 150 cwt. hourly. It has a double-impactor grinder and deflector-wall construction to 'bounce' partially ground material back into the grinding zone.

The air classifier—the heart of the system—further separates fines through an external dust collector that receives air containing fines of lowest micron size. The high-efficiency cyclones trap the superfines and return the effluent air to one of the classifier's air-inlet ports.

The small volume of air used by the classifier minimizes the size of required dust filters to cut cost and save space.

Here's how new classifier operates: Endosperm enters through an air-lock, then drops through a hollow tube surrounding a shaft that supports the rotor assembly. Product is discharged through ports and onto a distributing plate that whirls it out into a rising air stream.

Air containing 'fines' is pulled through a rapidly revolving selector-blade assembly that is adjustable for degree of fines cut, and is forced into classifier's outer chamber for settling out of most fines. Latter are ejected through a bottom-located air lock.

Coarse product proceeds to the inner chamber, from which it is ejected at a point above fine's discharge. Further separation of fines is accomplished by an external dust collector that returns material of lowest micron size to the classifier.

Turbo Milling

Another advanced flour-milling system features a unique classifying method. It's Pillsbury's 2-step turbo milling technique that employs a combination of impact and fluid energy of particles in a high-velocity air stream to reduce kernels to sub-sieve range. The classifier separates particles to 1/6 the size attained with present silk screens.

Key to the process is an advanced mill and classifier unit. Mill employs a vertical rotor with radial blades whose shaft is segmented by disks. Air vortices between blades are created as the 1,500-2,500 rpm.-motor produces peripheral speeds up to 30,000 fpm. Kernels are impacted in-air and ground to coarse particles, with attrition accomplished in air vortices (between blades) to fine-grind to less than one micron. Also, particles are impacted against sides of mill.

Centrifugal classifier (with peripheral inlet and axial-outlet) provides high air dilution that forces particles to follow inertial forces for high-efficiency separation.

There's also milling interest in Entoleter's 40-in. impact mill, with possible use of an air-vortex machine for classifying. Typical of latter is the Sharples unit that handles up to 50 tons/hr. of drys.

Acknowledgement: Author expresses appreciation to the following companies for their aid in preparation of this Special Report: Allis-Chalmers Manufacturing Co., Milwaukee; Food Machinery & Chemical Corp. (Canning Machinery Division), San Jose, Calif.; Link-Belt Co., Chicago; Simplicity Engineering Co., Durand, Mich.; Sprout, Waldron & Co., Inc., Muncy, Pa.; Stephens-Adamson Mfg. Co., Aurora, Ill.; and Sturtevant Mill Co., Dorchester, Mass.

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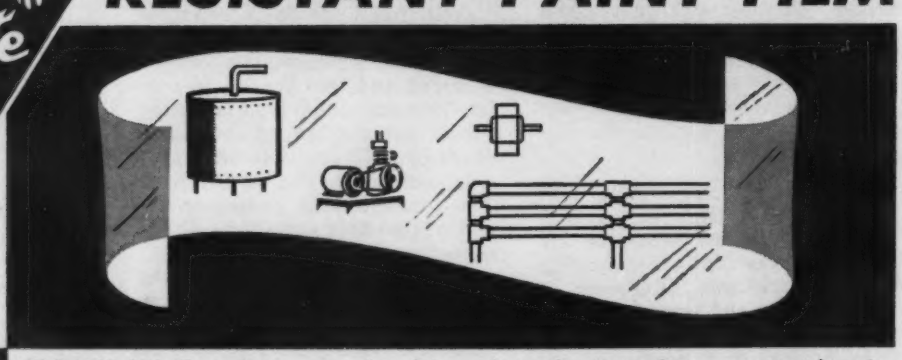

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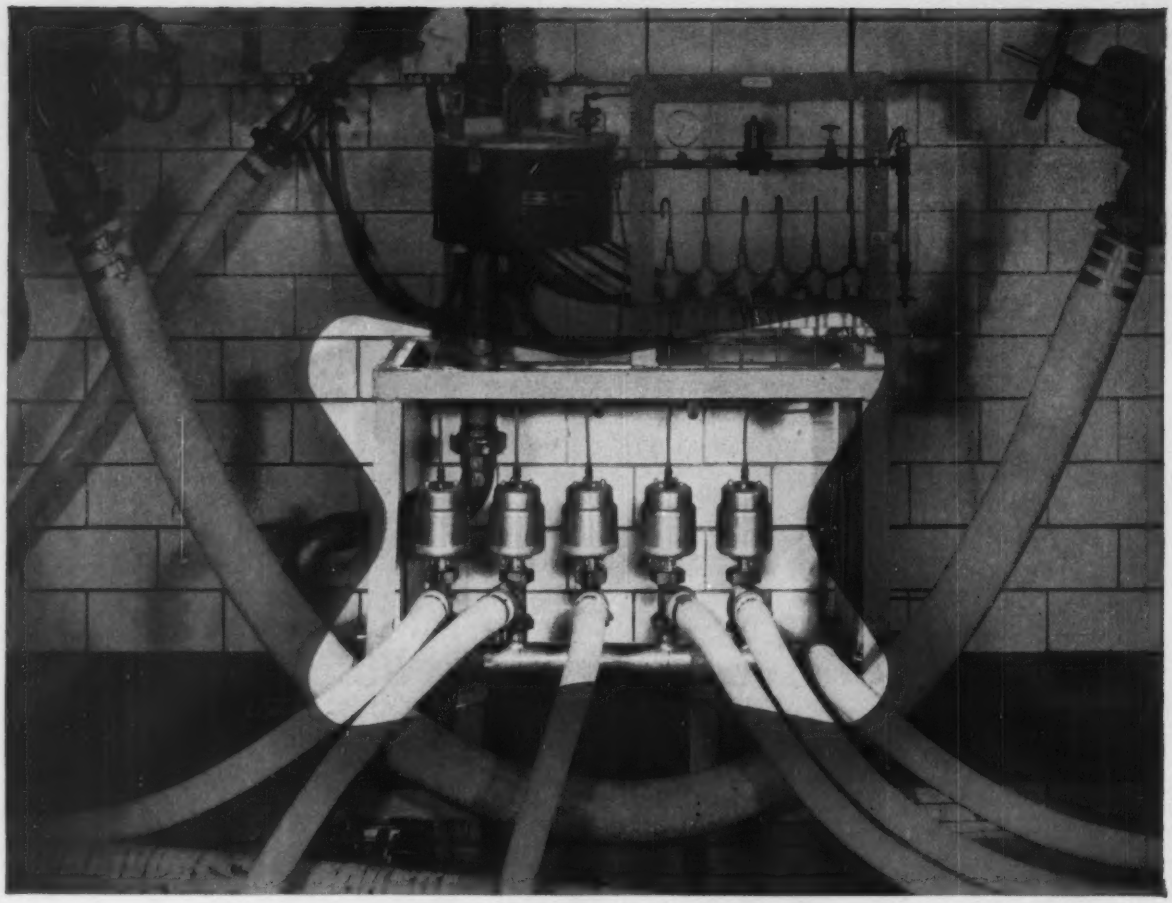
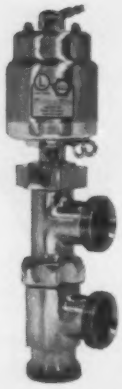


How Miller Brewing Company utilizes automatic valves to measure clarity of filtered beer



Ask your nearest Tri-Clover distributor about the complete line of air actuated valves for fast, automated flow control to reduce processing costs, increase worker output and improve inventory control.

Miller Brewing Company and Ladish Co., Tri-Clover Division engineers recently worked out a better way to measure and record the clarity of famous Miller "High Life" beer . . . by using five air actuated valves to automatically control product flow from the filters. A "Turbidity Meter" monitors the lines by signaling for shut-off of the valve at the first sign of filter build-up.

The result: Miller Brewing Company is now assured of direct, positive and automatic measuring of one of their most valuable "properties"—the *clarity* of the "Champagne of Bottle Beer." With this type of installation, Miller Brewing Company is in a position to exercise the most exacting control of the clarity of the beer.

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Food-Beverage Spending Up 3%

Final Commerce Dept. returns on 1960 show consumer outlay for foods and beverages edged up 3.3%. However, while this brought post-war upsurge to new peak, gain rate lagged behind other key indicators. Personal income and food store sales, for example, each moved up 5%, overall consumer expenditures increased 4.5%. **As a result, food and beverages siphoned off smaller chunks of consumer income (22.8% vs. 23.5% in '59) and expenditures (24.7% vs. 25.2% in '59).**

At the same time, Commerce disclosed that its latest manufacturers' poll points to a 3% sales gain for food-beverage makers this year. This is slightly better than the 2.5% improvement shown in '60.

Cool Look for Overseas Sales

Expansion into foreign markets isn't always the cure for a company's profit ills, warns George Phillips, Armour Research Foundation. Speaking at an American Management Assn. seminar, he urged that "overseas diversification must be viewed as only one of a number of profit making courses."

He lists these preliminary steps for outfits considering such a step: (1) While Europe gets the most attention, see if other continents have a "less competitive climate." (2) Compare potential of overseas market against that of the domestic field. (3) Weigh the likelihood of foreign competition invading the U. S. market—more possible for products with a high labor content. (4) Be prepared to give export marketing "considerable time and effort."

Profile of Convenience Market

New breakdown of consumer purchases of citrus and competing products provides insight into the type of buyer for convenience-type items. Made by Marketing Specialist W. E. Black, Florida Citrus Commission, analysis spotlights family consumption by socio-economic status, education, age, presence of children, and family size.

During past decade, for example, high income families consumed more frozen orange concentrate than low income units, but rate of increase in buying was inversely related to income. Higher the housewife's education level, the greater her product purchases—although this factor is declining in influence. Households with children consumed more than those without them. And older aged families increased their consumption at a faster pace than younger households, but their intake rate is still below average.

Continental Fights Back

Hard-pressed by rising costs and chain label competition, Continental Baking is making bold advances on the laboratory and retail fronts. Lab-developed low-fat cocoa has saved the Hostess Cake operation $100,000, and an improved instant mashed potato (made from dehydrated spuds) has netted Morton division a $132,000 savings.

Marketing innovations include: New specialty items for premium-priced Daffodil line that are made in a central bakery and sold only from special in-store departments, a line of lower-priced items specifically slanted at smaller outlets, an in-store impulse-sales device that surrounds bread shelves with a "fresh-baked" aroma, and acquisition of a Honolulu bakery—where, Pres. Newton Laughlin observes, "there is a picnic season 52 weeks a year."

Marketing Signals

Food rise slows down . . .

Sober view on exports . . .

Fizzier 'pop' sales ahead

Thirstier Mañanas Ahead

Impressive as the growth in soft drinks has been the past 10 yr., even faster expansion lies ahead, predicts William C. Durkee, Pepsi-Cola v. p. That's because, he reasons, **"nearly 80% of the volume is still consumed by less than 20% of the population."** Cultivation of that untapped potential, he feels, could lift soft drinks' retail sales from today's $2.3 billion to $10 billion.

BRIEFS

Institutional market may increase 25% or more by '70, reports USDA's "Agricultural Marketing." Last year's level: $17 billion.

Meat packers are weighing idea of "butcher shops" in supermarkets to serve as listening posts for testing new products. Outcome depends upon success in reversing the consent decree.

New dimensions for one-stop shopping: Food chains are forging closer links with drug stores and discount houses via acquisitions and shopping center tie-ins.

Some 70% of the instant sauce packages are bought in quantities of two or more, R. T. French says.

Brand share differences at local level are part of new service offered by Market Research Corp. of America. Move is in response to trend by food makers to concentrate on smaller geographic segments to improve marketing productivity.

HIGHLY STYLED label was introduced by Armour 2 yr. ago as part of redesign program to give canned meat line strong family identity. Quality appeal was enhanced by foil wraparound, with a large white panel strategically placed to attract shopper's attention. White "Armour" lettering was set against color block for strong brand recognition. When sales didn't gain, Armour assigned package design firm Robert Sidney Dickens Inc. to investigate.

VISUAL SURVEY in 7 selected marketing areas turned up the following: Armour label lost impact when stacked on store shelves, because it tended to "blend" into competitors' wraps. With logotype off-center left, clerks tended to center it, thus permitting only half of container's front to be seen by shopper. Large white panel looked as if it was the whole label, causing foil to recede and lose its quality appeal. Overall white area made can seem smaller than rival ones.

NEW DESIGN, now appearing in stores, made these changes, based on survey findings: Shield effect gives definite center to label. Logotype was also centered, against background photo of product being served, to reinforce this element. And to make can look larger, shield is separated from blue below with wide white band and smaller succeeding silver strip. Product name is centered under shield's tip at bottom for faster recognition.

How To Keep Your

Here is Armour's successful 5-point program for keeping its "in-store salesmen" way ahead of competitive innovations and changing supermarket environment

SCORING A COMPETITIVE EDGE in the vital packaging area gets harder to pull off these days. That's because "unplanned obsolescene" often cools off new ideas and designs even before sales begin to warm up.

So says Carl D. Scoby, package development and design manager at Armour & Co. Putting food packaging through the wringer, he notes, are these key trends:

. . . **"Competitive conformity"**—similarity of design. That's because, he argues, marketers "want their products to stand out. When they see a rival item which sells well, they look for a package which will do just as good."

. . . **Growing importance of supermarket environment** — where "changes in retailing methods force package modifications." Two new in-store developments that may set off a widescale redesign wave, Scoby contends, are (1) "tray pack" style of shelf stocking that often hides key brand elements, and (2) upright frozen food freezers that will need "face-out" containers instead of today's flat units (see photos).

How does Armour keep its packages from being tripped up by the competition, or changing supermarket conditions? Here is the company's five-point program as outlined by Scoby at a recent Packaging Institute meeting:

(1) "Stay even" with what the competition is doing. Or, as he puts it: "Keep your communications up to date so that you know at all times what is happening to your package in the market place. Not month to month, or week to week, but day to day."

(2) Make full use of your sales force. "Communication lines to all markets already exist via established sales organizations," the Armour official points out. "These should be utilized to the fullest in checking competitive developments, changes in retailer practices, or the appearance of some new packaging innovation."

There's one caution to observe here, warns Scoby. "Reports from sales sources will be neither entirely accurate nor objective," he adds. "But they can be indicative of some meaningful move that

THAYER C. TAYLOR
Associate Editor, "Food Engineering"

Two Challenges To Your Package

NEW IN-STORE TRENDS that may force broad package redesigns are "tray pack" shelf-stocking and upright freezers. If shelf display method spreads, containers will have to be redesigned to prevent "must" copy from being hidden by carton lip. Also, shippers will have to include product identity line along bottom strip. Frozen food packages, designed to lie flat in freezer cabinets, will have to be re-geared to "face out" stacking if upright freezers catch hold.

Package 'Up Front'

warrants further investigation. In most cases, the reports will concern a regional truism possibly not affecting your national picture. These local conditions, however, very often are a grassroots forecast of things to come."

(3) Do more "brain-picking" on outside sources doing business with your company. Among the many avenues for "field information" which you can use, says Scoby, are suppliers, ad agencies, business magazines, trade shows, and industrial advertisements.

(4) Don't play hermit. "One of the most reliable sources of information is yourself," stresses Scoby. He urges food managers to "program their time on a consistent basis for a personal 'do-it-yourself' in-the-field visual survey." He pointedly observes, in this connection, that "checking a package on the highly polished desk surface is far removed from the package's normal habitat—the overcrowded supermarket shelf."

(5) Research-research-research. Conceding that the merits of packaging research are still a controversial point, Scoby feels that the "new tool has its uses, even though business is still a little shaky in knowing just how to employ it."

For Armour, such research helps the firm "to know with dead certainty what we face in the way of obstacles on the retail shelf." Also, Scoby adds, sound fact-digging "will tell us to as near a degree as possible just how right or wrong we are."

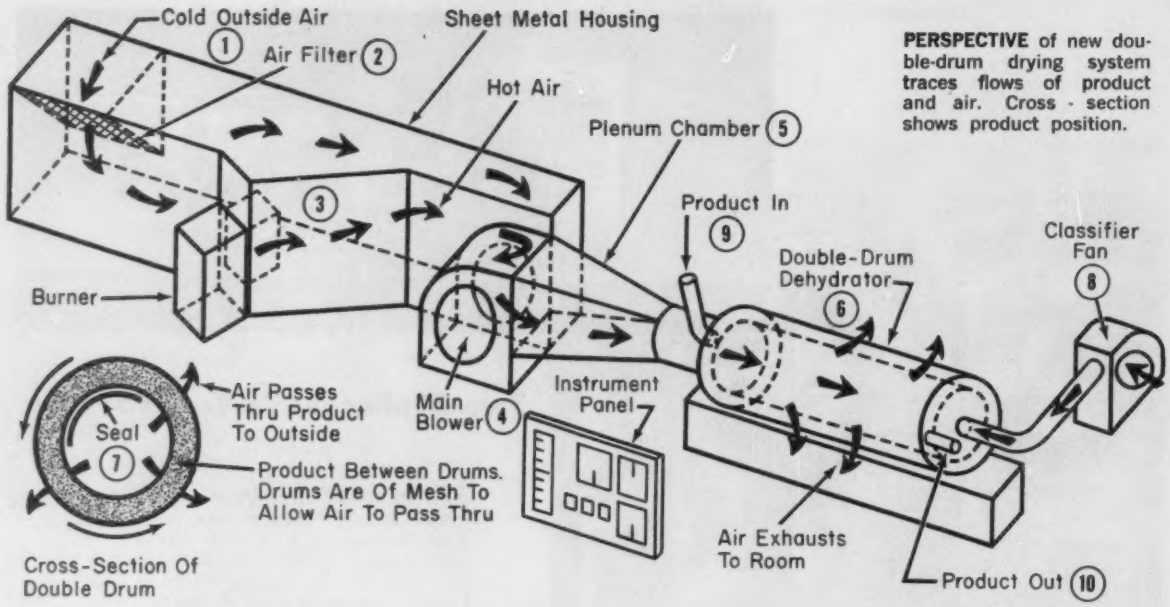
It Works

Armour uses such research in both the pre-design and post-auditing stages. It employs an outside design group whose staff men, trained in visual reporting, document a supermarket through 35-mm colored slides and special report forms. They list such pertinent facts as stacking procedures, lighting, and width and depth of a department.

The packer picks typical distribution areas for survey work. Then the field men, covering a representative sample of all types of retailers — chains, voluntaries, co-ops, superettes, "Mom 'n Pops" —document the conditions. Competitive merchandise is bought for pre-design studies, and new competitive packages for post-design audits.

According to Scoby, "Before a package appears on the market, we know fully what it must face and overcome on the shelf. After it is in distribution, consistent checks reveal whether it is performing as planned or facing a new development which requires quick action." (End)

Appreciation is expressed to Dickens Inc., Chicago, package design firm, for photos used in this article.



PERSPECTIVE of new double-drum drying system traces flows of product and air. Cross-section shows product position.

Engineering Boosts Dehydrofreezing

Low-temperature drying and air-classifying technique guards product flavor, improves control of final moisture content . . . Wide application to 'hard-to-dry' items seen

FLAVOR RETENTION and satisfactory hydration have been particular problems in dehydrofreezing of delicate foods, such as peas.

That's why processors are now keenly interested in a basic process improvement said to produce dehydrofrozen peas which, when reconstituted, are indistinguishable from the fresh product. Since peas are the trickiest of the green vegetables to dehydro-freeze, this development may well add an impressive number of delicate items to the list of products now commercially dehydro-frozen — apple slices, pimientoes, peas, diced potatoes and carrots.

Credit for this latest advance goes to Lamb-Weston, Inc., Weston, Ore. In extending USDA's developments of the dehydrofreezing process (FE July '55, p. 43), they pioneered the use of a special double-drum dryer that incorporates a unique air-classifying system.

The company-designed continuous dryer keeps product temperature below 100F., which is vital to fresh-flavor retention. And the classifier automatically removes product from the drying zone when it has reached the predetermined degree of dehydration.

In contrast to freeze-drying, dehydrofreezing involves drying a product to about half its weight and bulk, and then quick-freezing it. The technique has offered significant savings in packaging, storage, and shipping costs (FE Dec. '57, p. 117). Now, the Lamb-Weston process extends its application.

The complete system can best be illustrated by the processing of peas which, because of their skins, require special pre-treatment.

Slitting Aids Hydration

Peas, on the vine, are brought directly to the plant for shelling to protect their fresh flavor. After inspection, cleaning, etc., they are size-graded and sent to an Urschel scarifier. Latter consists essentially of two parallel rolls, one resilient and the other with circular blades that put a tiny slit in each pea.

Slitting is not done to aid drying, but to ease subsequent hydration of the pea. For efficient slitting, peas put through any one machine must be of the same sieve size. After being slit, peas of different size can be mixed for further processing.

Products such as carrots and potatoes, which have no skins to impede reconstitution, do not require slitting.

Controlled Drying

Next, peas are conveyed to the double-drum dryer, where they are contained in the space between the two drums.

As shown in our lead illustration, the dryer draws outside air (1) through a filter bank (2). Air is heated directly by a natural-gas flame (3) and is drawn into the main blower (4). Latter delivers the heated air via a plenum chamber (5) to the dryer's inner drum (6) at a static pressure of about 5½ in.

Air temperatures of 170-180F. are used for peas; for diced carrots, up to 250F.

The dryer drums are made of

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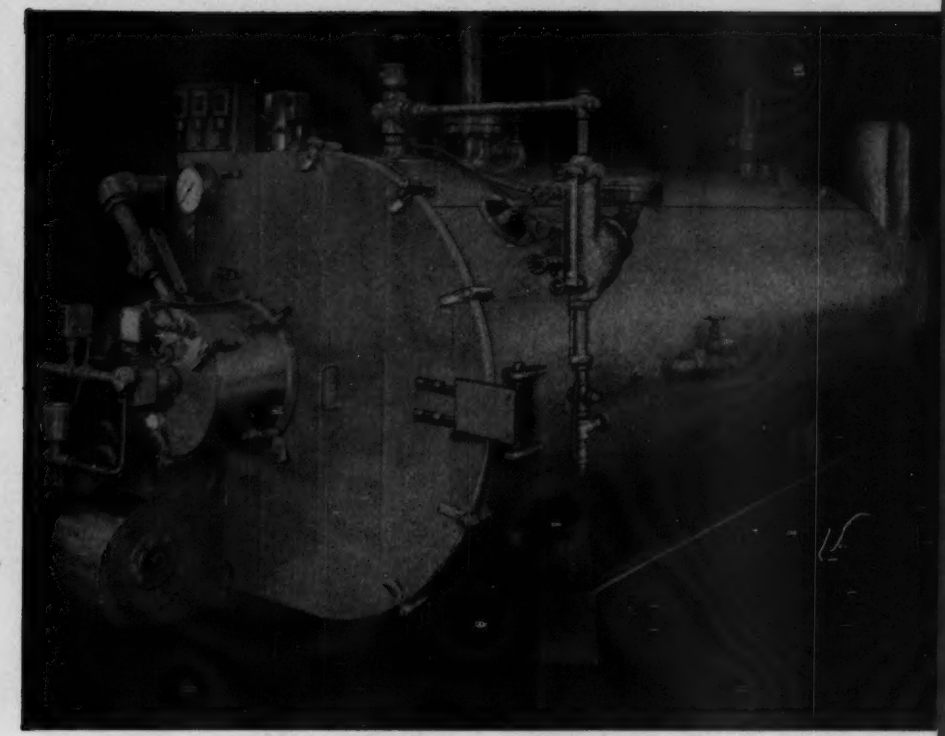

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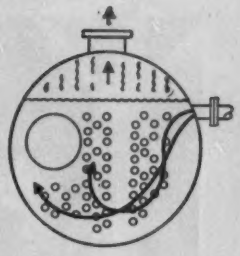

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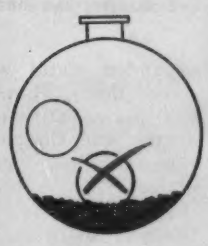
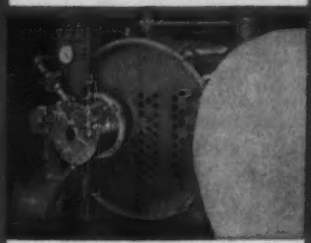


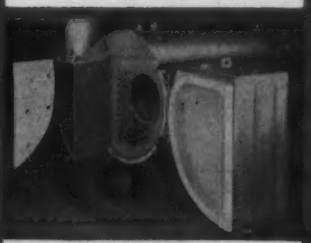
SIDE LOCATED FURNACE

Side located furnace eliminates danger of heat damage due to stagnant water and sludge. Turn-around spaces are simple, accessible and positive sealed.



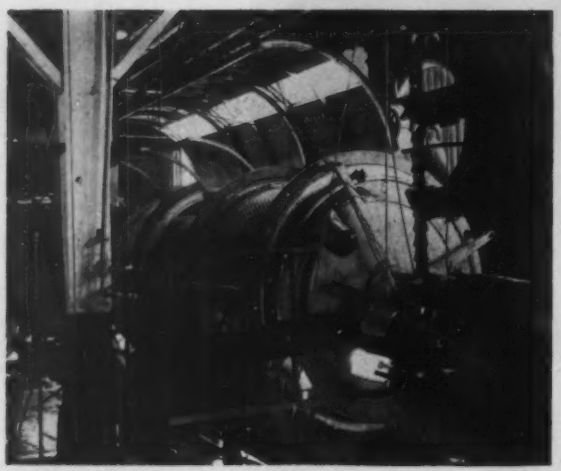
HINGED FRONT COVER

Hinged front cover, with quick-opening fasteners (no bolts) can be opened for access to heating surface without disturbing burner, wiring or piping.

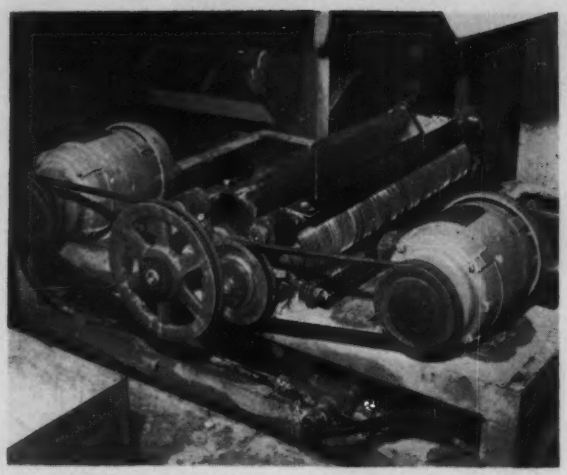


DIVIDED REAR COVER

Hinged rear cover, also with quick-opening fasteners, permits ease of accessibility and maintenance. Each cover section forms a separate seal in a single plane, providing protection from short-circuiting of combustion gases. No internal baffles to leak.



CURVED WIRE-MESH construction of dryer's screens is seen in open position. Unit handles peas at rate of 4,000 lb./hr. and removes two-thirds water.



PEA SLITTER with resilient roll and sharp knives slits each pea to ease hydration. Upon reconstitution in cooking, slit disappears.

expanded metal with wire-mesh screen liners. There are stationary end plates at each end of the drums, and the drum ends form a movable seal against these end plates.

At the drums' discharge end, the end plate is solid from its center to its circumference. At the feed end, however, the end plate has a center opening for entry of heated air.

A sheet-metal seal (7), fitted closely to the inside of the top of the inner drum, prevents air from exhausting out of this portion of the drum periphery. This is the spot where product tumbles over the top of the inner drum—the only agitation it receives. During the remainder of the drums' revolution, product is stationary between the drums.

Thus, the peas change position once each drum revolution, which keeps them from overdrying on one side.

As drying proceeds, a classifier blower (8) feeds air to the interior of the drums so that the driest particles move toward the discharge end faster than do the moist ones. This classification step enables better control of final-product moisture.

Product enters the dryer through a chute opening (9) in the end plate between the two drums. It discharges through a similar opening (10), which is positioned to receive the tumbling peas at the discharge end.

Capacity of the dryer is about 4,000 lb./hr. of dry product, or 8,000 lb./hr. of raw material. In processing of carrots, Lamb-Weston uses a belt-trough dryer ahead of the double-drum unit to eliminate surface moisture. This takes some of the load off the double drum and lessens downtime for cleaning.

As product leaves the main dryer, it drops onto a belt for quick-freezing at 2,000 lb./hr. Generally, frozen product is caught in large bins at the end of the belt, and later repacked in 1- and 2-lb. packages, and in 50-lb. bulk containers.

Process Economics

According to Lamb-Weston officials, it may or may not cost just a little more to dehydrofreeze a product than to freeze it in its original form. Because about two-thirds of its water content has been removed, the dried product freezes much faster. Power savings in freezing just about offset the cost of fuel for drying.

This leaves savings in freight, storage, and packaging as a bonus. Some of the savings must, of course, go toward amortization of the drying equipment.

L-W uses the following rule of thumb for pricing dehydrofrozen products with 50% weight reduction:

Cost of dehydrofrozen item equals twice the regular frozen price plus one penny.

Freight and storage savings more than offset the penny, particularly for goods shipped overseas.

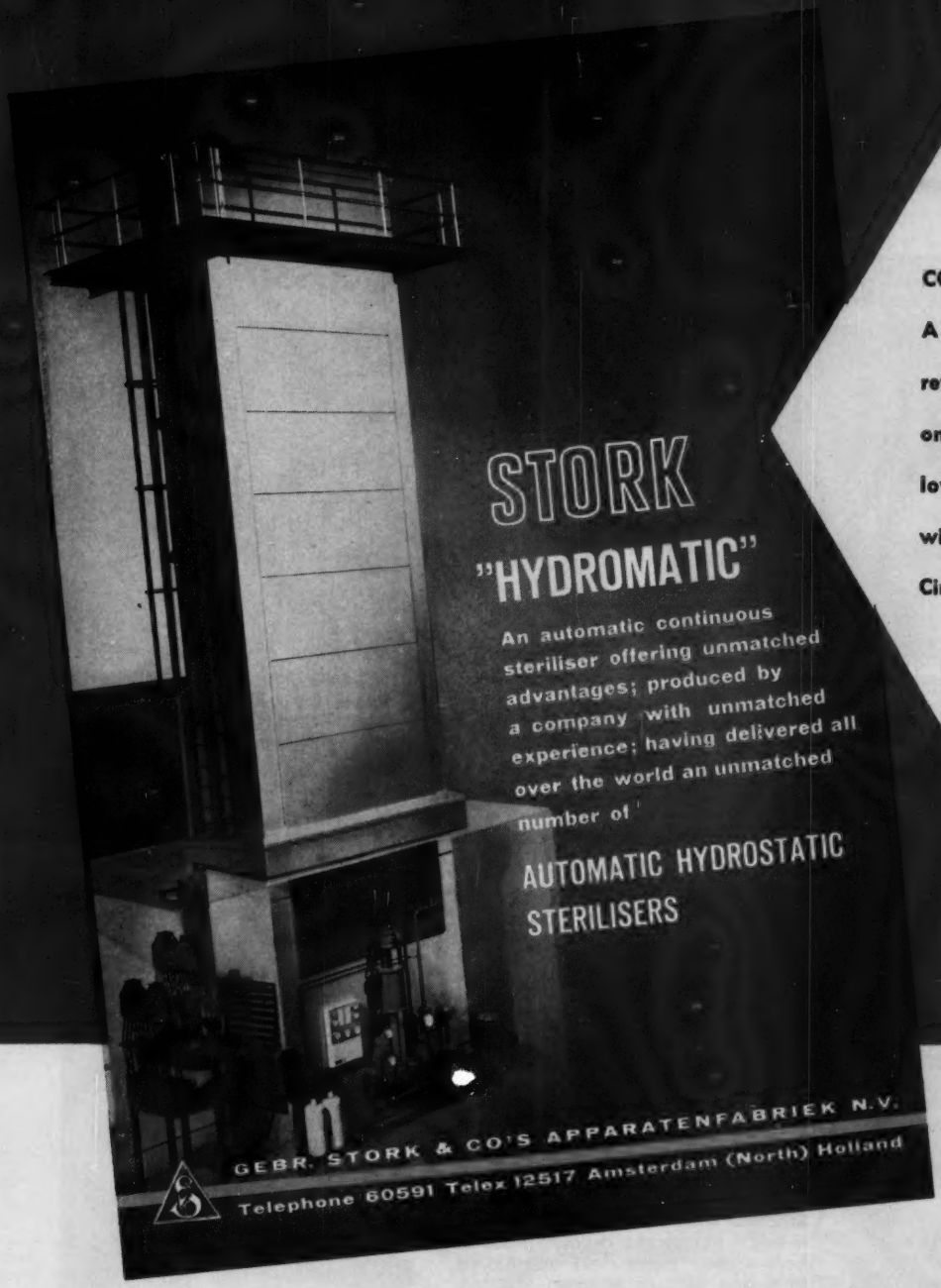
Last season, L-W packed 700,000 lb. of dehydrofrozen peas and 500,000 lb. of carrots cut to ⅜-in. cubes. In addition, an experimental pack of cubed potatoes was made on commercial equipment.

Products were sold to the Quartermaster Corps, to remanufacturers, and in the export market.

Next year, L-W plans to boost production to supply the above outlets, and to test the domestic institutional and consumer markets. (FE Staff)

Who's Dehydrofreezing

COMPANY	PRODUCTS
Lamb-Weston, Inc., Weston, Ore.	Peas, diced carrots, diced potatoes
W. F. McIntosh Co., Geneva, N.Y.	Apple slices
California Vegetable Concentrates, Inc., Huntington Park, Cal.	Pimientos
J. R. Simplot Co., Pocatello, Idaho	Potatoes
General Foods Corp., White Plains, N. Y.	Various food ingredients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containers per day is the present total capacity of trouble-free Stork Hydromatic Sterilizers throughout the world, installed during the last 15 YEARS

True, Stork of Amsterdam is leading in the field of sterilization. Having delivered over 200 hydrostatic sterilizers all over the world Stork has the know-how to exactly serve your needs.

Whether you use round, square or irregularly shaped cans, lithographed or labelled, one Stork Sterilizer may handle your entire production, or at least very nearly so. Special sterilizers effect automatic rotary sterilization the "safe and efficient hydrostatic way"

Due to weatherproof construction, Stork Sterilizers require a building no more than 10 ft. high. Floor surface required: about 80 sq. ft. Then, of course, enormous savings on steam (70%), and water (80%) may also cure peak-load problems on steam raising and water disposal. We will appreciate opportunity to send you the facts.

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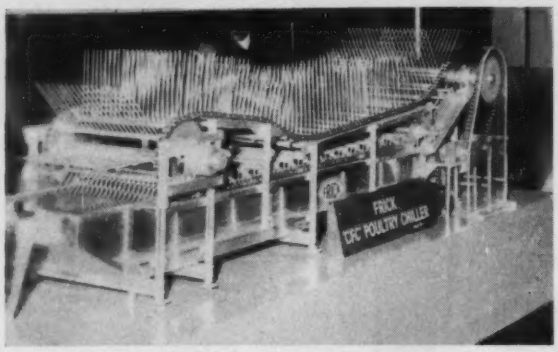
Circle 1 on Inquiry Card

FE *Camera Spots* 14 *Highlights*

4 Advanced Processing Units

MONORAIL CONVEYOR for shackled birds changes elevation while loaded and in position. Photocell-operated counters and a tape printer record number of birds processed per minute on killing, eviscerating, and dry lines.—F. H. Bathke Co., St. St. Paul, Minn. **(336)**



COUNTERFLOW UNIT (demonstration model) continuously chills 30-50 birds per min. to below 37F. In actual 54-ft. machine, cold water is flumed against poultry as it is conveyed on closely spaced, chain-mounted racks.—Frick Co., Waynesboro, Pa. **(337)**

7 Modern Packaging Systems

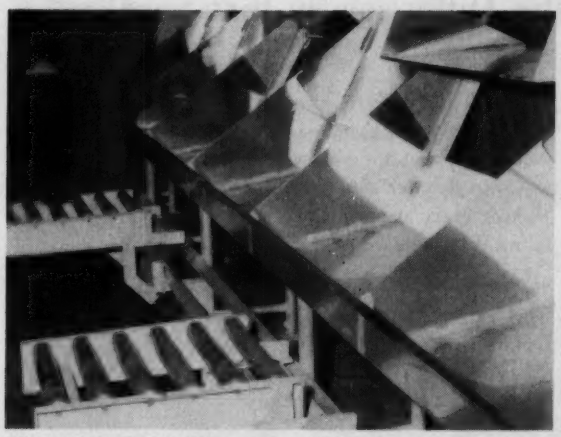
FREE-DRAINING poultry shipper is impregnated with wax and resin. Telescoping unit eliminates top icing, thus permits shipper to truck additional 10,000 lb. of poultry.—Stone Container Corp., Chicago. **(340)**

GIZZARD WRAPPER cuts roll-fed paper to length as operator deposits products from 4 bins. Plows make longitudinal folds and package is rolled. Output: To 93 wraps per min.—Stevens-Band, Inc., New Orleans. **(341)**

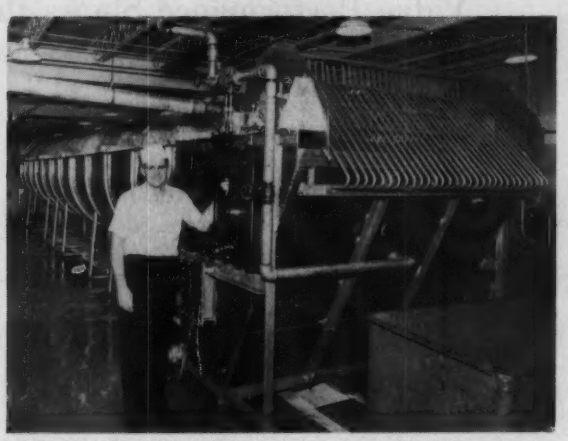
CELLOPHANE OVERWRAPPING (Hayssen unit) of egg cartons ups product shelf life, makes carton tamper-proof, and highlights carton printing.—E. I. du Pont, Wilmington **(342)** and American Viscose, Phila. **(343)**

FIBERBOARD SHIPPER holds 60 lb. of poultry. Telescoping unit is resin-sized inside and polyethylene coated on two sides for greater wet strength. Weep holes permit drainage of melted ice.—The Mead Corp., Cincinnati. **(344)**

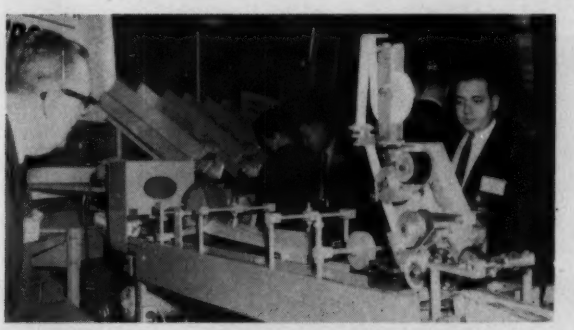
Latest chillers, egg-stabilizing system, product handlers, and packaging units spotlighted at Kansas City Poultry Show



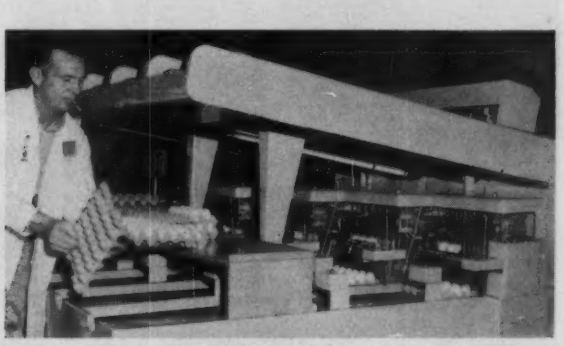
POULTRY-SIZING BINS ease packing of various-size birds. Unit has two roller-type conveyors that traverse an angle-iron track. Stainless-steel shelves mounted over each bin can, if necessary, by-pass small birds for cut-up.—Paul Mueller Co., Springfield, Mo. **(338)**



CONTINUOUS CHILLER handles up to 3,000 birds per hr. The 50-ft. unit, with plate cooler and helicord screw, ice-chills birds to below 40F. in 40 min., cold-water chills in 90 min. It is easily adjustable for 2-lb. broilers or 5-7 lb. fowl.—Pappas Industries, Houston, Tex. **(339)**



FAST-FORMING egg carton features 7 protective bridges, 4-ply center ridge, and fins. It is set up and closed on automatic unit.—Central Fiber Products Co., Waterloo, Ia. **(345)** and Packaging Corp. of America, Quincy, Ill. **(346)**



AT 300 CASES PER HR., automatic egg packer channels graded and stamped eggs to orienting conveyor for packing into flats or cartons.—Big Dutchman Automatic Poultry Feeder Co., Zeeland, Mich. **(347)**

3 DOZEN EGG CARTON is new approach to volume sales. A machine attachment for packing eggs into cartons is available.—Bloomer Bros. Co., Newark, N. J. **(348)**

3 Other Highlights

EGG-PROCESSING SYSTEM controls Salmonella, heat-stabilizes liquid and dried products by special de-aerating, steam infusion, and vacuum technique (Preparizing).—Creamery Package Mfg. Co., Chicago. **(349)**

BARBECUED POULTRY is made by dipping birds into dry spice mix, stuffing into shrinkable vinyl bag, clip-sealing, cooking in 180F. water (1¼ hr. per lb.), and ice chilling.—Visking Corp., Chicago. **(350)**

EGG CARTON'S floating-cushion cuts breakage. Straight sides and bottom offer easy stacking, egg removal.—KVP Sutherland Paper Co., Kalamazoo, Mich. **(351)**

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When service conditions require valves of Stainless Steel, remember that metal is only part of the answer to long, dependable valve performance.

The WAY valves are made is equally important. Factors you can't even see make a big difference. Such factors as *perfection of castings . . . precision machining . . . painstaking inspection and testing . . . sound design.* Most important of all: *the maker's guiding policy about quality.*

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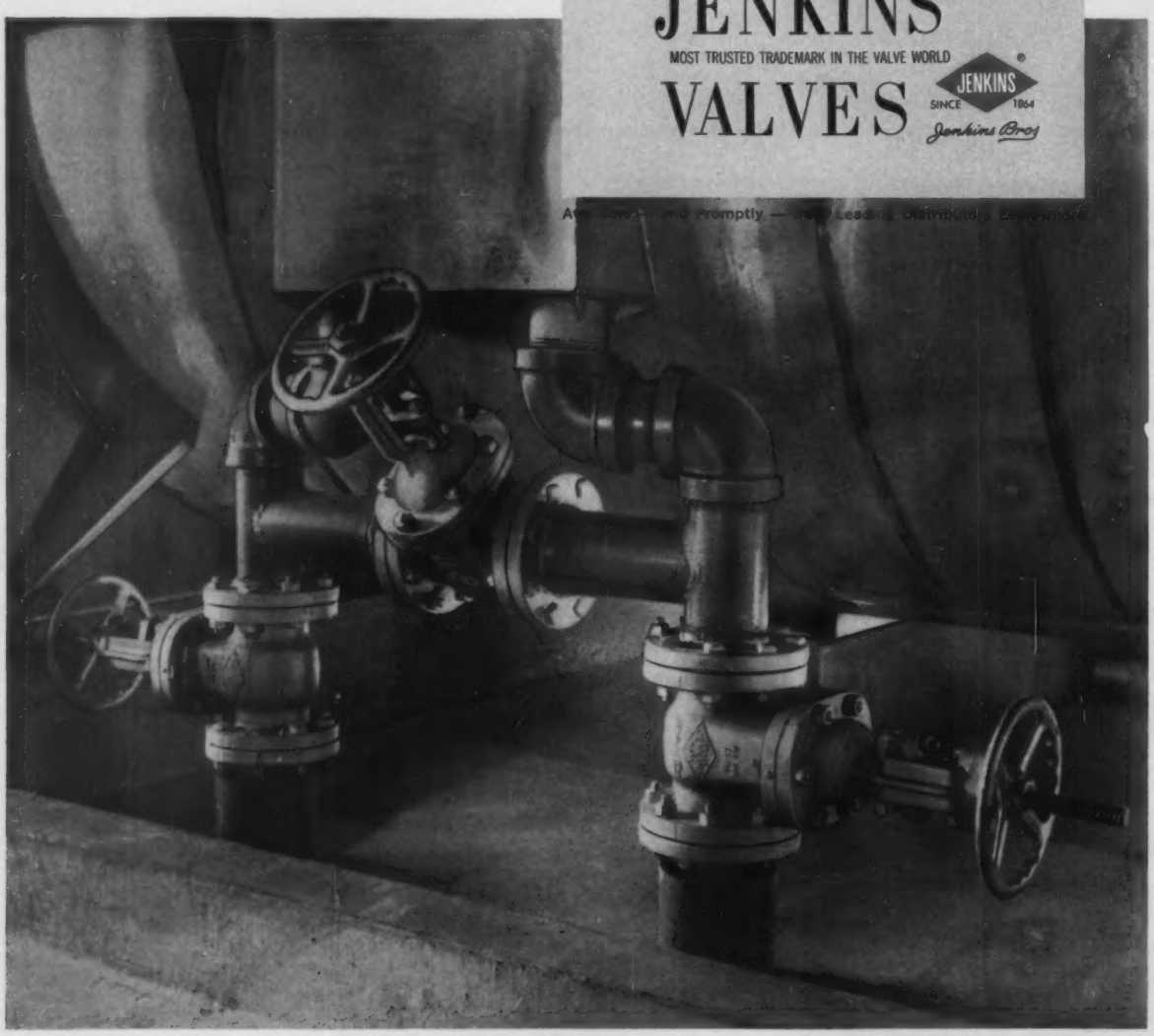


Advances in Technology

Inhibition to Salmonella in Eggs Researched

Salmonellae occur in eggs and egg solids often enough to constitute something of a public health problem. Elimination of them in egg products would be desirable.

During the fermentation of egg white to eliminate sugars prior to drying, Salmonellae can multiply rapidly. If the fermentation could be carried out by an organism antagonistic to *Salmonella* the latter might be controlled during the desugaring process. While many bacteria are known to be antagonistic to *Salmonella* the ideal organism should be nonproteolytic, nonpathogenic, and should produce no off odors, no off flavors, and no pigments.

More than 700 bacterial isolates from a wide variety of sources were screened for antagonism to *Salmonella*. Of these, 19 were able to inhibit *Salmonella* in some degree but were not satisfactory for fermentation by failing to grow in egg white, to ferment it, or to produce a satisfactory product after fermentation.

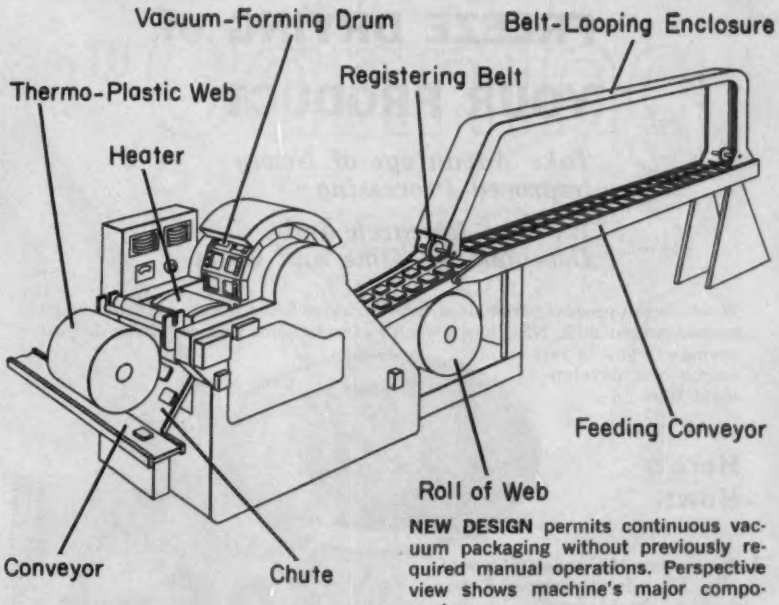
Four *Escherichia coli* cultures were effective and two of these (6-204-55 and 1673A) were tested extensively on egg white fermentation. In the laboratory trials fermentation of egg white by *E. coli* 6-204-55, followed by the addition of 0.5 per cent of hydrogen peroxide, resulted in *Salmonella*-free egg white.—*Applied Microbiology*, 366-370, June, 1960.

Consistometer Measures Butter Consistency

The Consistometer was perfected for measuring spreadability (by a knife) and hardness (by a wire) of butter. It differentiated between butters with 120 to 500 g. of hardness and 260 to 1,542 g. of spreadability. These ranged from easy to difficult to spread on the basis of a consumer panel evaluation.

Evaluation of 109 commercial samples from 14 different states revealed a high degree of correlation between instrument and panel. Results indicated that the most desirable butter consistency from the consumer's viewpoint represents a range on the Consistometer of 400 to 900 g. spreadability, or 140 to 200 g. hardness, under conditions of study.

Analysis of manufacturing data supplied by companies showed significant correlations between spreadability and/or hardness to method of pasteurization, churning temperature, and butter storage temperature.—*Jour. of Dairy Science*, 1560-1569, Nov., 1960.



NEW DESIGN permits continuous vacuum packaging without previously required manual operations. Perspective view shows machine's major components.

Continuous Vacuum Packaging Machine Is Successful on Commercial Scale

Flexible vacuum packaging materials, widely used today, are practically always of the transparent heat-sealable type. They are impervious to moisture, liquids, and gases. Further, these materials are obtainable in the form of webs coiled into large rolls.

Previous commercially successful vacuum packaging machines, using such flexible packaging materials, have required: The manufacture of bags or other containers; manual insertion of the product to be packaged; and the manual placement of the unclosed package in the vacuumizing and heat-sealing machine. Prior attempts to provide a continuous machine have not been fully successful in a commercial sense.

Overcoming these obstacles is a recently patented machine to which the product is fed, arranged in rows. The product may be luncheon meat, cheese, or some perishable which must be protected from the atmosphere. The machine also will: Make use of rolled webs of material to build containers about the product; evacuate the containers; and then heat-seal.

No manual operations are required. The machine permits gassing of the packages with nitrogen or some other inert gas, a practice becoming more common.

Machine performs reliably under continuous commercial operation and produces commercially satisfactory packages.—*U. S. Patent No. 2,935,828.*

Baking Test Measures Flour Strength

A "Remix" baking test, designed to measure strength, uses a malt-phosphate-bromate formula. The dough is mixed for 3.5 min. in the GRL mixer or 2 min. in the Swanson mixer. After fermenting for 165 min. without punching, the

How NRC can help you with FREEZE DRYING of YOUR PRODUCT

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... Save Research and Development Time and Costs

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dough is remixed for 2.5 min. in the GRL or 80 sec. in the Swanson. A recovery time of 25 min. is allowed, and the dough is then sheeted, molded, panned, proofed for 55 min., and baked.

This new method requires no skilled punching, facilitates mechanized molding, is reproducible, and is relatively insensitive to variations in timing. It detects extreme strength more readily, and discriminates mode widely between strong and weak flours, than the regular malt-phosphate-bromate straight dough method.—*Cereal Chemistry*, 603-613, Sept., 1960.

Phosphorylated Mannan Increases Foam Life

A long-lived and attractive foam is highly desirable in beer. Phosphorylated mannan, a high molecular weight, exocellular, phosphorylated polysaccharide produced by the yeast *Hansenula holstii*, has a great beneficial effect on the stability of beer foam.

The product is a white powder, readily soluble in cold water. It may be introduced into beer either as an aqueous solution, or the solid may be dissolved directly in the beer during manufacture. A workable concentration range is 20-80 ppm. However, noticeable improvement in beer foam stability can be observed at a concentration as low as 5 ppm.

The addition of this substance to beer in these very small amounts markedly increases the time which elapses between pouring the beverage into a glass and the disappearance of the foam so formed. Moreover, this ingredient does not impair the stability, taste, potability, or brilliance of beer.—*U. S. Patent No. 2,943,942.*

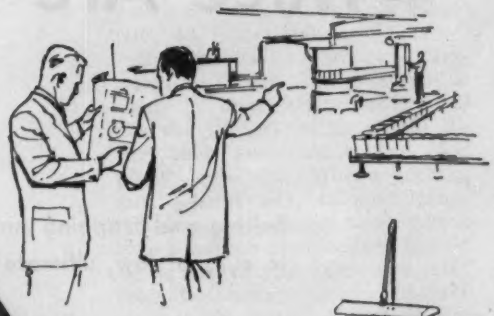
Increasing Cooling Rates Through Thermal Radiation

A material enclosed in a dark, non-reflective container will cool more rapidly than one enclosed in a reflective container.

Under certain specified conditions, it has been shown that the cooling time for material in black, non-reflective containers is 20 to 25% less than the cooling time for material in reflective containers.

Therefore, it may be concluded that a dark, non-reflective covering around a product should substantially decrease the cooling time in conventional air coolers.—*Food Technology*, 4-5, Jan., 1961.

FROM Planning... TO Canning!



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Canco service starts long before production. Canco operates the world's largest food research laboratory and has unmatched experience in canned food product formulation. Its Technical Service people are ready to act as your consultants on the proper use and formulation of raw materials, canning methods and equipment, quality control, or any problem relating to the canning procedure.

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The aim of Canco service is to produce containers that promise you better packaging, fewer production stoppages, lower packing costs. That means a better product... *more profits for you!*

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The exhibit is a fallout shelter, approximately 500 square feet, fully equipped to care for the emergency requirements of a family for a two-week period.

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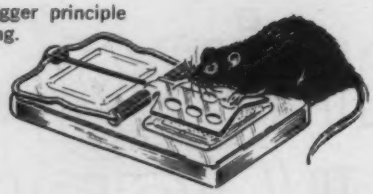
SNAP TRAP features enlarged trigger principle and recessed well for liquid baiting.



Mice Are Underrated in Food Plants

Baiting and trapping are effective means of controlling rodents. In eyes of law, ultimate sanitation responsibility rests with plant

PART II— Baiting and Trapping

ONCE THE INITIAL, basic elements of mouse control are effected (see FE Mar. '61, p. 79) in and around the food plant, such as harborage elimination, rodent proofing, etc., then it is necessary to establish a safe and effective rodent trapping and poisoning program.

In the interest of safety and product protection in a food plant, baiting or poisoning should be used only in non-food processing areas, and trapping only in areas where food is exposed.

The use of poisons in a building may result in a rodent dying behind a wall, under the floor, over the ceiling, etc. Removal of carcasses will prevent offensive odor. Where this is not possible deodorizers can be employed, such as a saponated solution of creosol, pine wood oil, zinc chloride, paradichlorobenzene, and lime. Despite claims, no poison drives poisoned rodents from a building.

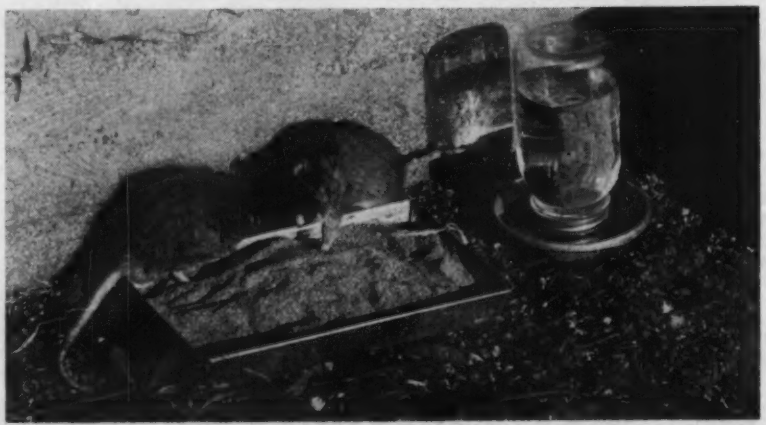
Bait Boxes Necessary

Even in non-food processing areas, it is important that rodenticides or baits be distributed in proper bait boxes only. Rodenticide bait boxes are available in many forms. The good ones are equipped for both dry and liquid bait. They serve the purpose of protecting the bait from being carried into the food stream and also providing a sheltered place for the rodents to feed. Good bait boxes are provided with a hasp so that they might be locked and the contents shielded from humans.

An anti-coagulant rodenticide requires ingesting by the rodent every day from 5-7 days to effect a kill. Because of this large consumption, an ample supply of bait must be provided. The liquid dispensers inside the bait box can take many forms, but most of them are of the common chicken-feeding variety with an inverted glass mason jar in a shallow pan.

Rodenticide bait boxes can be used not only inside the plant but outside as well if they are durably constructed. Available bait boxes can be purchased from fifty cents up to almost $10.00 each, depending on construction and type of material—cardboard, metal, masonite, or wood. Box should be secured to the floor so it cannot be tipped over or moved about and it should be labeled as containing a poison. Bait boxes usually have two entrances so as to be attractive to rodent entry and should be large enough to provide ample feeding for the rodent.

Mice do not sit down and eat a large amount of food at one sitting like a rat does. Instead they duck in and out and dart around picking up a morsel of food here and there.



RODENTS feeding on anti-coagulant rodenticide, both dry and liquid. (Photo U. S. Fish & Wildlife Service)

T. L. HUGÉ
President, The Hugé Co., St. Louis

BAIT BOX of wood, metal, and masonite, supplying both dry and liquid bait. Hasp on lid provides locking.

Use of Rodenticides

Basically, there are two types of poisons or rodenticides that can be used—liquid and dry or cereal variety. It is best to use both. But it is only common sense to emphasize liquid bait in a plant processing dry food products such as bakery goods, macaroni, candy, etc., since the rodent would have adequate dry food from the plant and would therefore seek palatable liquids. Conversely, a dairy plant or a beverage plant should rely more heavily on cereal type baits for the same reason.

Mice are able to exist for periods exceeding four months without water, and their food preferences vary from dry cereals (cornmeal, rolled oats, etc.) in the presence of ample water, to moist foods (apples, etc.) in the absence of water. Further, they feed many times, thus the need for ample feed supply.

Rodenticides such as arsenic, strychnine, phosphorous paste, thalium sulphate, etc., are frequently employed by exterminators or pest control operators — but again should be generally avoided in food processing plants because of their toxic nature.

Anti-coagulant rodenticides work on the principle of thinning the rodent's blood to a point where hemorrhage and death result. In order to effect this, the rodent must continue to eat the bait for about a week, which brings up one of the most important factors in rodent poisoning. Emphasis is placed much more on the poison that effects the kill rather than the bait itself. This is wrong. Unless the rodent finds the bait fresh, attractive and palatable he will not eat it, and therefore no matter what poison it carries no control will be effected. **The rodent must eat the bait in order to be killed and, particularly with anti-coagulant baits, he must eat a lot—and so it must be attractive.** The selection of lures to incorporate into baits is very important. For mice the best attractants are such materials as sugar, peanut butter oil, rolled oats, cornmeal, etc.

Some of the anti-coagulant poisons now available for incorporation in a bait are Warfarin, Pival, Fumarin, Dicapitan, and PMP. The plant can buy any one of these anti-coagulants and mix its own bait, or it can buy a prepared, ready-to-use bait. We recommend the latter for best results.

Sodium Fluoracetate, commonly known as "1080", is a very virulent poison in liquid form which should only be employed by experienced, licensed operators who place it preferably on weekends, only in locked bait boxes, and remove it before it has been exposed too long.

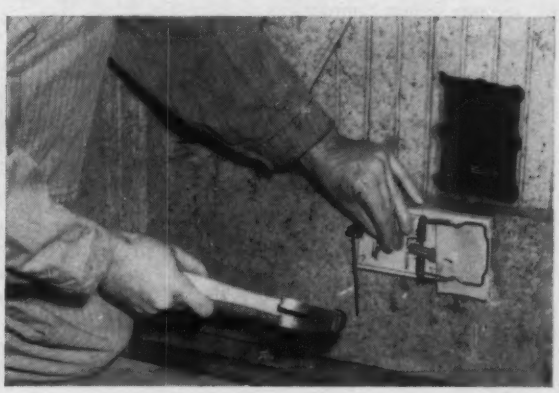
With cereal type baits, the bait itself can become very badly infested with insects which are themselves an objectionable sanitation hazard. It is possible to obtain a commercial dry bait that has been fumigated and mixed with an insecticide.

Bait should be changed frequently. If the bait offered to them is unattractive, they will not eat it. Instead they will divert their attention to the food plant's products. Where cooking oils, peanut oils, or such other "binders" are used in these cereal type baits, an anti-oxident should be employed to keep the bait from becoming rancid. Contrary to popular belief, cheese is not a good attractant for mice, and meat or fish baits are really seldom necessary.

More Baiting Facts . . .

. . . **Because of evaporation,** liquid bait needs more frequent attention. It should be offered in dispensers where an ample but not over-abundant amount of the liquid is exposed to cut down on this evaporation.

. . . **Another technique** in rodent control is the use of tracking poison. This involves dusting a poison (50% DDT) along rodent runways so that rodents will pick this material up on their feet. Then in licking themselves, they will ingest sufficient quantities to effect a kill through stomach poisoning. However, in a food plant it is hazardous to use such dust because of the danger of food contamination. Other control techniques usually are more effective anyway. (turn page)



STRATEGIC placement of trap with extended trigger will aid rodent control. (Photo U.S.D.A.)

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Automatic Thayer Scale Controls 3 Ingredients in Cranberry Sauce Processing, Cuts Handling Costs and Increases Profits.

Costly, time consuming measuring, feeding and blending operations in the making of cranberry sauce have been mechanized with 1 Thayer Scale. Now a Thayer Metering Scale continuously feeds cranberries, at precise rates, to the cooking process. In addition, the scale automatically controls the 2 other ingredients required, resulting in better product quality and uniformity at lower handling costs.

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. . . **There is a practice termed "pre-baiting"** whereby baits are placed for several days but do not contain the poison ingredient. The rodent gets to eat and enjoy this bait. After the fourth or fifth night, poison is added and the rodent is quickly killed. However, this pre-baiting is really not necessary. Rodents will continue eating anti-coagulant baits until death, even when they are hardly strong enough to approach the bait.

Tricks of Trapping

The first principle in trapping is that **an ample number of traps should be used.** For mice where the common snap variety is employed, one of these traps should be placed about every 5 to 10 ft. in areas where mouse activity is encountered. A good preventive rodent control program dictates that as many as a gross or two of these snap variety traps should be constantly set out.

The "catch" of mice can actually be doubled in these snap traps if the "extended trigger" principle is employed. This means that a heavy piece of cardboard or a piece of screen can be inserted in this trigger so as to make a large treadle which doubles the surface for triggering the trap. Such traps should be placed so as to force the rodents to cross over them by blocking a runway, placing behind a box, or a ledge used as a runway. When lying flat on a surface, straw or shredded paper in a thin layer can be used to mask the trap.

One very unusual trap, about the size of a shoe box, is wound up by hand. The curiosity of the mouse and its small travel area practically demands that the mouse enter the trap. It has a small doorway opening into which the mouse enters and in so doing will step on a treadle and be sprung into a cell. These traps will catch up to 20 mice at one setting. In one or two nights all the mice in that area will end up in the trap, almost as though by magic.

Other Tips . . .

. . . **Do not use petroleum oil** to prevent rusting of traps. Wipe metal parts with bacon rind to protect from rust and to attract also.

. . . **More rodents are trapped** on the first night, therefore, distribute a large number of traps on the first night.

. . . **A dirty trap** in which a rodent has been caught may be more effective than a clean one for trapping others.

. . . **After traps have been in use** for a few days the rodents may tend to avoid them because of human odor. Therefore, scent traps with bacon rind or other animal fats.

Plant's Responsibility

Food plants troubled with mice frequently prefer to rely on an expert. Often an exterminator will be called in to render periodic service which mostly involves placement of poison baits. Thus, the plant feels that it has divested the problem onto the shoulders of an expert and is no longer responsible. Basically, the plant is held responsible by law (the Federal Food, Drug and Cosmetic Act). Plants must cooperate with the outside agency whose work should be carefully checked to make sure that control is effective. For this reason, the exterminator should fill out a form whenever he visits as to the bait he is using, his observations, and how many bait placements were made.

The plant should keep storage away from the walls, up off the floor, eliminate any harborages, and follow any recommendations made by exterminator.

For example, a white traffic stripe painted at the wall-floor juncture is effective in warning against storage that might be placed against the wall and also to provide a bright area for inspection for evidence of rodents (or insects).

There is no reason why a food plant cannot effect a good rodent control program on its own. The principles of poisoning and trapping are quite simple.

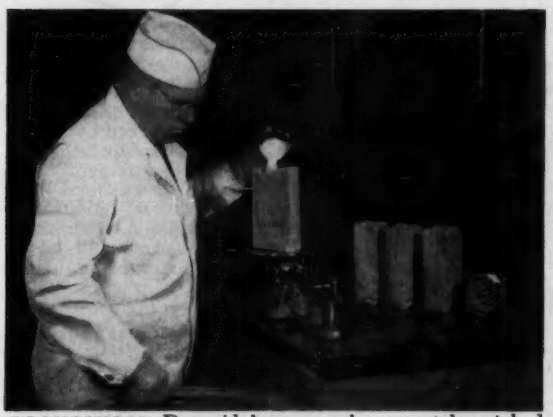
With both bait boxes and traps, it is a good idea as part of the rodent control program to number these and keep a record of the "catch" in the traps and of those bait boxes showing the most rodent activity. Records of this kind are very impressive to outside regulatory agencies as indication of a good preventive rodent control program in effect.

The best rodent control program requires constant measures. With no let-up in its control program, a food plant can keep itself free from infestation—and from disciplinary action by law enforcement agencies. (End).

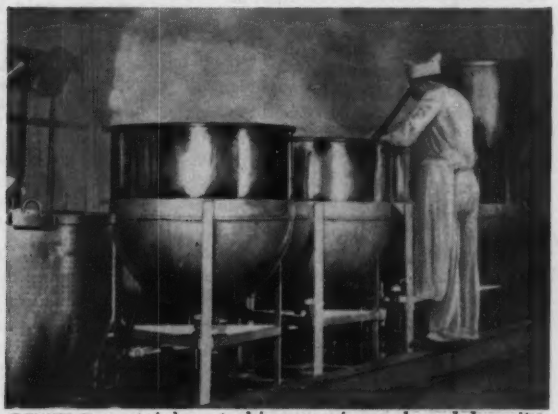
For fast removal of scale and protein deposits from cooking vessels, pipelines, evaporators, use safer **dry acid** cleaners based on **Du Pont Sulfamic Acid**

SAFER TO HANDLE. These dry acid cleaners eliminate hazards of broken carboys, spattered liquids, corrosive fumes. The cleaners are dry, nonfuming powders, packed in easily handled, disposable drums.

EASIER TO USE. Just scoop out required amounts of dry acid cleaner and add to make up tank. Often can be added directly to equipment being cleaned . . . no elaborate equipment or specially trained labor required.



ECONOMICAL. Dry acid cleaners can be accurately weighed and packaged—eliminating costly overuse by unskilled employees. These concentrated cleaners, undiluted by water, save on shipping, handling and storage costs.



GENTLE on stainless steel in removing scale and deposits. Thoughtful personnel use sulfamic-based cleaners without fear of stress cracking or pitting of expensive equipment so easily induced with hydrochloric acid.

Ask your supplier for safer, effective cleaners based on Du Pont Sulfamic Acid, or mail coupon for additional information and names of formulators who offer these compounds.

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Please send me ☐ your "Quick Facts on Dry Cleaners" booklet. ☐ names of formulators offering cleaners based on sulfamic acid.

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CIRCLE 89 ON INQUIRY CARD

ONE OF A SERIES OF CHATS ABOUT CONSERVATION AND CONTROL OF HEAT

SARCO TOPICS

PROBLEMS OF PRECISE TEMPERATURES IN WINE PASTEURIZATION

It's a shame that so many people think you throw grapes in a vat, press them, bottle the juice, and just wait a while to create wine. Even those who pride themselves on their knowledge of wines are seldom aware of the artful engineering required. Pasteurizing wine is actually much more delicate and tricky than pasteurizing milk.

Take temperatures. Wine must be pasteurized at 140°F. And spoilage can cause economic havoc. Those are the facts of life in the world of wine. They might not seem too difficult to live with unless you're in the wine or food processing business. Then you probably know how tough things can get when you have a rendezvous with a thermometer.

Take New York's Monarch Wine Company, producers of Manischewitz Wines. Their Problem: how to maintain the 140° temperature in the heat exchangers despite wide variations in the rate of wine flow. These variations, between 5 to 60 gallons per minute, result from slowdowns and recoveries in the bottling process. Problem: entire system must be capable of complete shutdown when necessary. Problem: wine temperatures must be raised to 140° as rapidly as possible, sometimes an immediate jump of 100°.

Attracted perhaps by aspects of the situation that had little to do with pure science, Sarco engineers applied the collective experience of Sarco technology to the solution of this serious problem. The result for Monarch: the *degree of control* the process demanded—achieved through the excellent use of Sarco Temperature-Pressure Regulators, Float Thermostatic Steam Traps, Thermo-Dynamic Steam Traps, and Pipeline Strainers.

Sarco engineers, ever resourceful, divided each of the two large Cherry-Burrell plate-type heat exchanger units into two separate sections with a blank baffle plate, each with a separate Sarco control. Thermal sensing bulbs were installed in wine discharge and throttling controls hooked into steam supply. As demand

fluctuates, one or both regulators function to maintain the 140° temperature. In higher demand, both regulators are operative; as demand drops and flow decreases, only one regulator supplies steam. Pasteur himself would have been elated.

Each of six smaller capacity shell-and-tube heat exchangers required only one regulator, with sensing bulb inserted into the outlet side of the wine filled shell, and the regulator throttling steam supply to the tube section. Thus, by controlling flow of steam to the exchangers on the basis of pressure and temperature, the Sarco regulators were able to maintain the temperature of the wine at precisely 140° regardless of fluctuations in demand or supply rate. Whew! A lot of engineering went into those two sentences.

From here on it's downhill. To secure complete cut off of the steam supply during scheduled shut-downs of the bottling run, solenoid valves were provided to supplement normal modulating action of the controls. To discharge widely varying loads of condensate continuously and remove immediately all air and incondensible gases, Sarco Float Thermostatic Steam Traps were installed on all condensate outlets. On the drips before each control valve a Sarco Thermo-Dynamic Steam Trap was installed to insure delivery of dry steam. Sarco Pipeline Strainers were installed before all steam traps and valves to protect them against damage by any foreign bodies. And thus ends a classic story of the grape.

Still, this story has been condensed far too much, really, and we feel you've been cheated out of the story's more delicious details. You needn't be, however. We've printed the facts in detail for posterity and you in Sarco Case History 185, complete with drawings that practically make it a do-it-yourself kit. If you would like a copy, we will be flattered to receive your request, and dispatch it with dispatch.

WE'RE ALWAYS IN . . . AND THE WELCOME MAT'S OUT

We always take it for granted that if you are going to be in the vicinity of our plant you'll phone or drop us a line so we can invite you to visit us. You'll find that our factory in Bethlehem, Pennsylvania, is on many well-travelled routes, and that our steam laboratory has much to offer in interest and helpfulness.

Forgive us for being immodest, but the lab is the most up-to-date of its kind in the country.

When you visit us, don't allow yourself to get sidetracked by the drill presses and automatic lathes. We're proud of this equipment but you've probably seen metal mutilated before, and it's our steam laboratory that's unique. We promise you a good show, and if you have any problems, bring them along. We'll solve them while you wait.

ANYONE FOR KEY CHAINS?

We seem to have these key chains. Want one? They're much more convenient than a case. A tiny replica of a Sarco Thermo-Dynamic Steam Trap, Type TD-50 is attached, but you can always remove it if you find it too commercial. There must be many things you could use these chains for. Fishing sinkers? Lengthening a light cord, maybe? Anyway, if your Sarco Representative is out, write in.

Pardon our monopolizing the conversation in this series of paid communiques, but we're trying our best to interest you in certain subjects that concern us both—to the point where you'll communicate.

5900

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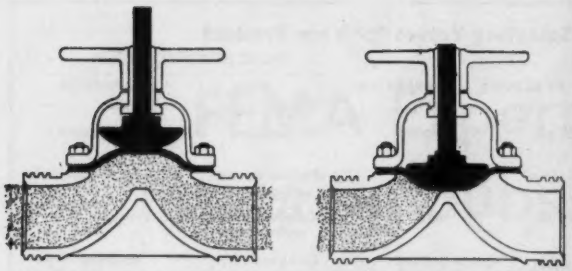

BATTERY of diaphragm valves, with indicating stems to show position, controls flow of MSG solution into carbon treatment process. Valves and diaphragms are made of variety of materials to combat corrosion. Cutaways show open and closed position of a diaphragm valve.

MSG Processors Combat Valve Corrosion

Matching valve properties to your product and operating conditions will help solve your corrosion problems. This is what Great Western Sugar did in MSG processing

CORROSION PROBLEMS generally mean protecting the equipment in the process. In the food industry it also means protecting the food product from the contaminating corrosion products. Example: MSG (monosodium glutamate) processing.

Although MSG must meet all of the contamination free requirements of normal food standards, it is really a chemical process using highly corrosive elements. One of the key ingredients in the process is hydrochloric acid. This places MSG processors among the most experienced corrosion fighters in the food industry.

MSG plants have gone up in several places during the past eight years. International Minerals and Chemical Corp. has put one up in San Jose, Calif.; Great Western Sugar Co. has erected one in Johnstown, Colo.; and Industrial Grain Products has built one in Montreal.

Corrosion is an important factor in the design of these plants. Much stainless steel is used along with rubber-lined tanks, neoprene diaphragm valves, and other materials such as Teflon, Kel-F, butyl rubber, natural rubber, and neoprene. Because MSG crystals are abrasive, precautions must be made for wear on equipment. Not only does the process require corrosion-resistant equipment but corrosion products would contaminate the liquors and make it impossible to obtain colorless crystals.

The most critical points in process lines when corrosion is a problem are the control and transfer points. Valves could be the trouble spots. In Great Western's Johnstown plant, almost all valves are Grinnell - Saunders diaphragm type. The diaphragms prevent abrasive particles from getting between moving parts, and the resilient valve diaphragm seals tightly over crystals on the weir.

How MSG Is Processed

Because of Great Western's long-standing policy of making full use of sugar beet by-products, the company's process is unique in several ways. It produces MSG from filtrates obtained when sugar is precipitated from beet molasses. The process is as follows:

Concentrated filtrates are weighed and blended in a mixing tank, clarified in a rotary vacuum precoat filter, then hydrolyzed by the addition of concentrated H_2SO_4 in a series of three mixing tanks. Flow of acid is controlled to give a pH of 3.2.

Potassium sulfate formed during acidification is removed in a continuous flow centrifuge. The separated salts are slurried in water, refiltered in another continuous centrifuge, and dried in a rotary dryer.

Filtrates are further clarified in another precoat filter, then concentrated to about 70% solids in a continuous single-effect evaporator. During evaporation a second crop of K_2SO_4 crystals forms. It is separated in a continuous centrifuge and processed with the first crop.

The concentrated filtrate is cooled and pumped to large crystallizing vessels where it is held for about five days. During this period crude glutamic acid slowly crystallizes. (Turn Page)

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Selecting Valves for Your Product

FOOD PRODUCT	TYPE SERVICE	TEMPERATURE	VALVE RECOMMENDATION BODY	DIAPHRAGM
Candy cream	28 in. vac.	234 F.	Bronze	Teflon
Soft drink fruit syrup	25 psi.	Ambient	Stainless steel	White rubber
Soft drink syrup	5–10 psi.	60–75 F.	Polished stainless, white enamel bonnet	White butyl
Lard, coconut, vegetable oils	20 psi.	100 F.	Stainless body with sanitary ends	Hycar
Sausage mix		Ambient	Cast iron	Neoprene
Water, steam and cereal husks			Bronze	Teflon
Pickling vinegar	Gravity	Ambient	Stainless steel	White rubber
Baby food	Gravity	180 F.	Stainless steel (polished interior, sanitary threads, galvanized bonnet, indicating stem)	Teflon
Margarine	50 psi.	34 F. to ambient	Stainless steel	White Hycar
Oil	80 psi.	120 F.	Stainless steel	White Hycar
Vinegar	Gravity	100 F.	P.V.C. screwed ends	Teflon
Tomato paste	20 psi.	220 F.	Stainless steel, (polished interior, galvanized bonnet, indicating stem)	Teflon
Mustard	40 psi	Ambient	Stainless steel, (polished interior, galvanized bonnet, indicating stem)	Teflon
Meat for canning	Gravity	190 F.	Stainless steel	Neoprene

Crude acid is then removed in plate-and-frame filter presses. The filtrate is neutralized with gaseous ammonia to yield a cattle feed known as LPC—liquid protein concentrate.

Crude glutamic crystals are reslurried, water-washed in batch centrifuges, then dissolved in water and NaOH as MSG. This solution of crude MSG is treated with vegetable carbon and filtered, then passed through a series of tanks to which HCl is added to reprecipitate purified glutamic acid.

Valve Problems

The following service conditions were presented to the Grinnell-Saunders engineers for valving recommendations: Hydrochloric acid (20° Baume) and carbon slurry; 20% activated carbon; glutamic acid; 93% sulfuric acid; 50% caustic soda; non-acid water; air and water; operation temperatures on the hot side of the evaporator at 150F.

The specifications adopted for the various conditions were as follows:

1) For handling hydrochloric acid (20° Baume), cast iron valve bodies were selected with rubber or Saran linings. The same type valves were used for the 20% activated carbon to give leaktight closures over carbon particles.

2) For handling 93% sulfuric acid, cast iron valves with Kel-F diaphragms were selected. Valves were fitted into 90 deg. bends with flanged and screwed ends.

3) To assure noncontamination of fluid from the "G.A." crystallizers, stainless steel valve bodies were supplied with butyl diaphragms.

4) Cast iron with rubber diaphragms was specified for 50% caustic soda.

5) Standard valves with neoprene diaphragms handle the Steffens solution. Valves are protected from clogging, sticking, or abrading by the diaphragms.

According to Great Western Sugar, "These valves have been in service for over six years now and have given excellent service with at least 90% of the valves originally purchased still in operation." (End)

"You told me to report any leaks, Sir!"

FEMA Expert Panel Judges Flavoring Substances as GRAS

Action by FEMA is within limits of law and aids both industry and government in regulating additives use

"THIS IS A REFRESHING new approach to the problem of food additives. The FEMA action is a fine example of what can be accomplished by cooperative effort on the part of an industry." So comments F. M. Depew, president, The Food Law Institute.

What the Flavoring Extract Manufacturers' Association did was to have its Food Additives Committee establish an expert panel to advise whether or not each specific flavoring substance is GRAS. The language of the law contemplates that a food manufacturer or a group of manufacturers, by means of competent experts, may conclude that a substance is generally recognized as safe for its intended use. The law, further, does not specify any agency, government or private, as a channel for decision on this matter.

The FEMA panel thoroughly examined all available evidence on a substantial number of flavoring substances and decided which are GRAS under the conditions of intended use. Here is the FEMA list:

Acetaldehyde.
Acetic acid.
Acetic acid, *iso*-amyl ester.
Acetic acid, anisyl ester.
Acetic acid, benzyl ester.
Acetic acid, *n*-butyl ester.
Acetic acid, *iso*-butyl ester.
Acetic acid, cinnamyl ester.
Acetic acid, citronellyl ester.
Acetic acid, *o*-cresyl ester.
Acetic acid, *p*-cresyl ester.
Acetic acid, cyclohexyl ester.
Acetic acid, *n*-decyl ester.
Acetic acid, ethyl ester.
Acetic acid, eugenyl ester.
Acetic acid, geranyl ester.
Acetic acid, 1-hydroxy-3-nonanone ester.
Acetic acid, linalyl ester.
Acetic acid, menthyl ester.
Acetic acid, α-methylbenzyl ester.
Acetic acid, phenylethyl ester.
Acetic acid, phenylpropyl ester.
Acetic acid, *n*-propyl ester.
Acetic acid, rhodinyl ester.
Acetic acid, sodium salt.
Acetic acid, terpinyl ester.
Acetoacetic acid, benzyl ester.
Acetoacetic acid, ethyl ester.
Acetoacetic acid, geranyl ester.
Acetoin.
Acetyl *iso*-butyryl.
Acetyl propionyl.
Acetyl valeryl.
Aconitic acid.
Allyl isothiocyanate.
n-Amyl alcohol.
iso-Amyl alcohol.
Anethole.
Anisaldehyde.
Anisic acid, ethyl ester.
Anisole.
Anisyl alcohol.
Anthranilic acid, allyl ester.
Anthranilic acid, *iso*-butyl ester.
Anthranilic acid, cinnamyl ester.
Anthranilic acid, cyclohexyl ester.
Anthranilic acid, ethyl ester.
Anthranilic acid, methyl ester.
Ascorbic acid.
iso-Ascorbic acid.

Benzaldehyde.
Benzoic acid.
Benzoic acid, *iso*-amyl ester.
Benzoic acid, benzyl ester.
Benzoic acid, ethyl ester.
Benzoic acid, geranyl ester.
Benzoic acid, methyl ester.
Benzoic acid, sodium salt.
Benzoin.
Benzophenone.
Benzyl alcohol.
Brominated vegetable oils.
n-Butanol.
iso-Butanol.
Butter acids*.
Butter esters**.
Butylated Hydroxyanisole (BHA).
n-Butyraldehyde.
iso-Butyraldehyde.
n-Butyric acid.
iso-Butyric acid.
Butyric acid, *n*-amyl ester.
Butyric acid, *iso*-amyl ester.
Butyric acid, benzyl ester.
iso-Butyric acid, benzyl ester.
Butyric acid, *n*-butyl ester.
Butyric acid, *iso*-butyl ester.
iso-Butyric acid, *n*-butyl ester.
iso-Butyric acid, *iso*-butyl ester.
iso-Butyric acid, cinnamyl ester.
Butyric acid, citronellyl ester.
iso-Butyric acid, *p*-cresyl ester.
n-Butyric acid, cyclohexyl ester.
Butyric acid, ethyl ester.
n-Butyric acid, geranyl ester.
iso-Butyric acid, geranyl ester.

Caffeine.
d-Camphor.
Carboxymethylcellulose.
Carvacrol.
Carvone.
β-Caryophyllene.
Cinnamaldehyde.
Cinnamic acid, *iso*-amyl ester.
Cinnamic acid, benzyl ester.
Cinnamic acid, *iso*-butyl ester.
Cinnamic acid, cyclohexyl ester.
Cinnamic acid, ethyl ester.
Cinnamic acid, methyl ester.
Cinnamyl alcohol.
Citral.
Citric Acid.
Citric acid, triethyl ester.
d-Citronellol.
l-Citronellol.
p-Cresol.
Cuminaldehyde.
Cyclohexylacetic acid, allyl ester.
3-Cyclohexylpropionic acid, allyl ester.
p-Cymene.

Decanal.
Decanoic acid.
Decanoic acid, ethyl ester.
1-Decanol.
2-Decenal.
Diacetyl.
Diallyl disulfide.
Diallyl sulfide.
Diethyl sebacate.
n-Dodecanal (Lauryl aldehyde).
Dodecanoic acid, *iso*-amyl ester (*iso*-Amyl laurate).
Dodecanoic acid, *p*-cresyl ester (*p*-Cresyl laurate).
Dodecanoic acid, ethyl ester (Ethyl laurate).
1-Dodecanol (Lauryl alcohol).

Estragole (*p*-Allylanisole).
Ethanol.
6-Ethoxy-*m*-anol (Propenyl guaethol).
Ethyl vanillin.
Eucalyptol.
Eugenol.
iso-Eugenol.

Formic Acid.
Formic acid, *n*-amyl ester.
Formic acid, *iso*-amyl ester.
Formic acid, benzyl ester.
Formic acid, cyclohexyl ester.
Formic acid, ethyl ester.
Formic acid, geranyl ester.
Furfural.
Furfuryl alcohol.
Furfuryl mercaptan.
α-Furylpropionic acid, *iso*-butyl ester.
Fusel, oil, refined—assuming that refined fusel oil is mixed amyl alcohols, predominately 3-Methyl-1-butanol.

Gallic acid, *n*-propyl ester (Propyl gallate).
Geraniol.
Glucose pentaacetate.
Glycerol.
Glycyrrhizin, ammoniated.
Guaiacol.

Heptanoic acid, *n*-amyl ester.
Heptanoic acid, ethyl ester.
2-Heptanone.
4-Heptanone.
1-Hexadecanol (Cetyl alcohol).
Hexanal.
2,3-Hexanedione.
Hexanoic acid.
Hexanoic acid, allyl ester.
Hexanoic acid, *n*-amyl ester.
Hexanoic acid, *iso*-amyl ester.
Hexanoic acid, ethyl ester.
Hexanoic acid, geranyl ester.
1-Hexanol.
2-Hexenal.
Hydroxycitronellal.
Hydroxycitronellol.
3-Hydroxy-2-methyl-γ-pyrone.
4-(*p*-Hydroxyphenyl)-2-butanone.

Indole.
Isopropyl alcohol.

Lactic Acid.
Lactic acid, butyryl. butyl ester.
Lactic acid, ethyl ester.
Levulinic acid, ethyl ester.
d-Limonene.
Linalool.

1-Malic acid.
Malic acid, diethyl ester.
Menthol.
Menthone.
p-Methiopropionaldehyde.
β-Methiopropionic acid, methyl ester.
p-Methyl acetophenone.
p-Methylanisole.
3-Methylbutyraldehyde.
Methyl *p*-cresyl ether.
1-Methylcyclopentadione-2,3.
Methy eugenol.
Methyl *iso*-eugenol.
2,6-(Di)Methyl-5-heptenal.
Monosodium glutamate.
Nonanal.
Nonanoic acid, *iso*-amyl ester.
Nonanoic acid, ethyl ester.

Octadecanoic acid, *n*-butyl ester (*n*-Butyl stearate).
Octanal.
Octanoic acid.
Octanoic acid allyl ester.
Octanoic acid, *n*-amyl ester.
Octanoic acid, *iso*-amyl ester.
Octanoic acid, ethyl ester.
1-Octanol.
Oleic acid.
Oleic acid, Glyceryl monoester.

α-Phellandrene.
Phenylacetaldehyde.
Phenylacetic acid.
Phenylacetic acid, *iso*-amyl ester.
Phenylacetic acid, ethyl ester.
Phenylacetic acid, geranyl ester.
Phenylacetic acid, guaiacyl ester.
Phenylacetic acid, methyl ester.
Phenylethyl alcohol.
o-Phosphoric acid.
α-Pinene.
Piperonal.
Polyoxyethylene (20) sorbitan monolaurate (Tween 20).
Polyoxyethylene (20) sorbitan monooleate (Tween 80).
Polyoxyethylene (20) sorbitan monostearate (Tween 60).
Propionic acid.
Propionic acid, *iso*-amyl ester.
Propionic acid, benzyl ester.
Propionic acid, *iso*-butyl ester.
Propionic acid, cinnamyl ester.
Propionic acid, *n*-decyl ester.
Propionic acid, ethyl ester.
Propionic acid, geranyl ester.
Propionic acid, *n*-propyl ester.
Propylene glycol.
Propylene glycol alginate.
Pyruvic acid, *iso*-amyl ester.

Quinine bisulfate.
Quinine hydrochloride.
Quinine sulfate.

Rhodinol

Salicylic acid, ethyl ester.
Salicylic acid, methyl ester.
Sarsaparilla, extract—judged solely on the basis of common use.
Sorbic acid, potassium salt.
Sorbitan monostearate (Span 60).
Sorbitol.
Stearic acid, glyceryl monoester.

Tartaric acid.
α-Terpineol.
Tetradecanal (Myristaldehyde).
p-Tolualdehyde.

n-Valeric acid.
iso-Valeric acid.
iso-Valeric acid, ammonium salt.
iso-Valeric acid, *iso*-amyl ester.
iso-Valeric acid, benzyl ester.
iso-Valeric acid, cinnamyl ester.
iso-Valeric acid, cyclohexyl ester.
n-Valeric acid, ethyl ester.
iso-Valeric acid, ethyl ester.
iso-Valeric acid, geranyl ester.
Vanillin.

Yucca brevifolia, extract.
Yucca, Mohavensis, extract.

---

* *Assuming that these are a mixture consisting only of the saponified acids reported in the literature as derived from butter in the approximate proportions normally occurring.*

** *Assuming that these are the ethyl esters of butter acids (q.v.).*

(See Editor's Opinion, p. 29, for more comments.)

Men & Companies

William Wood Prince

New Armour Chairman... William Wood Prince, president and chief executive officer at Armour Co. since '57, has been elected board chairman. He will succeed Frederick W. Specht, who has been chairman since '52 and who resigned recently. Mr. Specht will remain as a director.

Edward W. Wilson, former executive v.-p. of the Armour Chemical Industries, will replace Mr. Prince as president.

In his initial statement as chairman, Mr. Prince said that a squeeze on gross margins reduced the first quarter earnings from those a year earlier. He indicated that the decline in earnings resulted from meat packing operations, but added that Armour's fast growing chemical division had given new impetus to the firm.

Erwin C. Uihlein

Schlitz Ups Uihlein . . . Erwin C. Uihlein takes over as board chairman of the Jos. Schlitz Brewing Co. with Robert A. Uihlein succeeding him as president.

Erwin C. Uihlein has been president of Schlitz since '33. Robert A. Uihlein has been executive v.-p. of the company since '59. He is a nephew of Erwin and a son of the late Robert A. Uihlein, Sr., who served as Schlitz v.-p. and secretary until his death in '59.

Schlitz has enjoyed its greatest growth under the guidance of Erwin C. Uihlein. Since World War II it has grown from a single plant to an operation composed of five plants across the country.

Harry E. O. Heineman

Heads Pet R&D . . . Harry E. O. Heineman, R&D director for Pet Milk Co., has moved up to the newly created position of research and development v.-p.

Mr. Heineman joined the company in '46 as head of the St. Louis Research Div., following a distinguished career as research and education director for the Evaporated Milk Assn. Earlier he was chief chemist and product development director for a pharmaceutical company.

As the first director of product development at the Pet R&D Div., established in '58, Mr. Heineman has been responsible for a number of advances in Pet product development and has also supervised the company's medical relations and home economics programs.

Personnel

Frederick C. Sorensen has been elected a v.-p. of Pepsi-Cola Co. and manager of Eastern Div. C. T. Duncan

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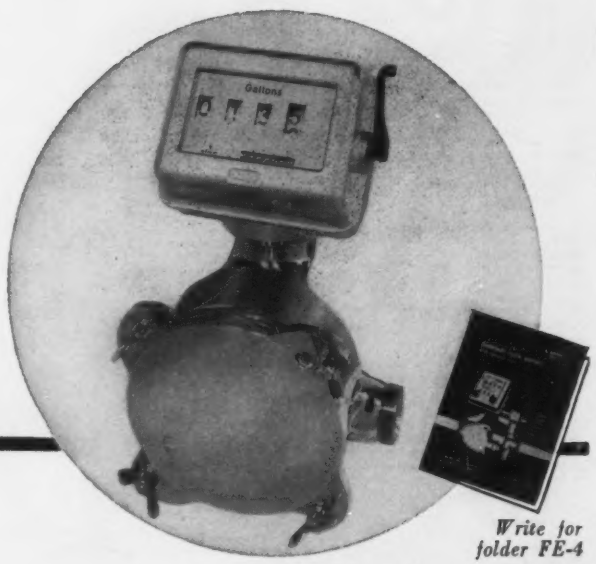
than any other equipment available for the same operation. Solve the mystery of hidden losses this simple practical, low cost way.



Write for folder FE-4

SIEMENS

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moves up to president of Bottlers' Assn.

A. Arnold Fagen Jr. has been named purchasing manager of Shoreline Enterprises of America, Inc., division of Salada-Sherriff-Horsey.

John W. Bush, former board chairman of Old Judge Food Corp., has been appointed to Interstate Commerce Commission by Pres. Kennedy.

Fred B. Roche is now products marketing manager of Morton Frozen Foods Div. of Continental Baking Co.

Jo H. Chamberlin is new public information director for The Nutrition Foundation.

Willard B. Gorsuch moves up to v.-p. of Dole Corp. and will head new Corporate Development Div.

Adolph A. Berle resigned as chairman and board member of American Molasses Co. to become special assistant to the Under Secty. of State.

Antoine Nuziard becomes president of Gordon Baking Co.

Keith L. Thomas takes over new post as director of planning and new products for General Mills' Grocery Products Div.

B. T. Rocca, Jr., president of Pacific Vegetable Oil Corp., has been re-elected president of National Institute of Oilseed Products.

Walter S. Driskill moves up to marketing director at Miller Brewing Co.

Myron L. Hyman and **Edson K. Green** are now board members at International Salt Co.

J. Roy Duggan resigned as v.-p. and assistant to the president of SeaPak Corp.

Joseph D. Farrell becomes president of Charles E. Hires Co., Div. of Consolidated Foods.

Arthur F. Cunningham moves up to executive v.-p. of Nalley's Inc.

(Turn Page)

No more marking problems

with an automatic "ROLACODER" marker

Attaches to conveyor, case-sealer, etc. to mark from side or top • Works by friction • Imprints legible mark in same spot on case after case • Takes only 1 or 2 minutes to change type • No tricky adjustments • Precision-made for long trouble-free service • Pays for itself in months • Other models for marking 2 and 4 sides simultaneously.

Now available with amazing 'MAGIC INK ROLL' that *never needs re-inking!* Made of PORELON® microporous plastic

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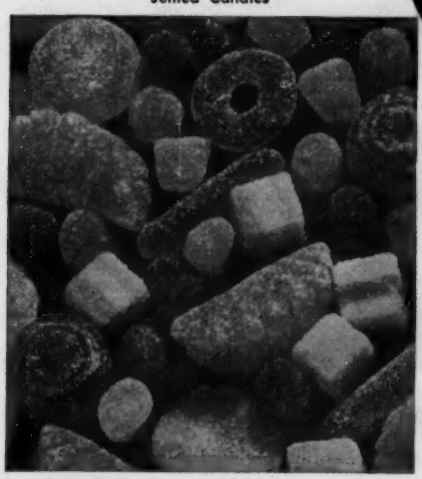
CONFECTO-JEL
Especially made for Jellied Candies



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APPLE PECTINS

- Adaptable to wide range of PH levels.
- Neutral color and flavor—blends naturally with more different fruits than any other pectin.
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- Improves spreadability of jams, jellies and preserves.
- Standardized to uniform strength so that product always has the same consistency.

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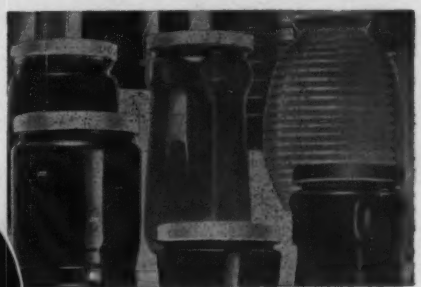

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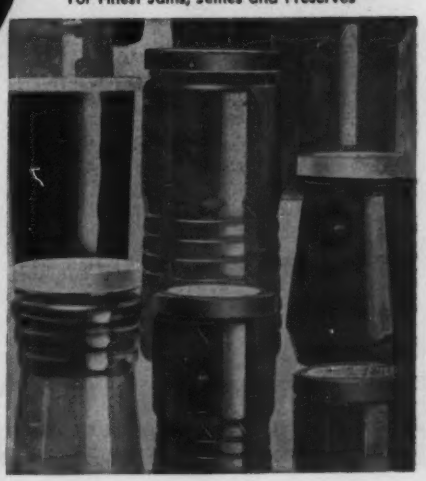
For Finest Jams, Jellies and Preserves



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INSTANT HOT WATER MAKER

Equipped with 50 foot hose, water saver and spray nozzle. Mixes Steam and Cold water with no chance of Steam Burns! Economical and easy to use.

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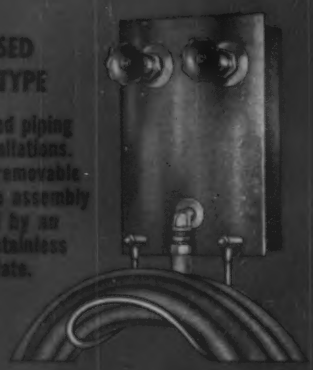
Hot and Cold Water or Steam and Cold Water right where you need it.



RECESSED WALL TYPE

For concealed piping on new installations. This unit is removable and the entire assembly is covered by an attractive stainless steel plate.

Consult your dealer for details and prices or write directly to us.

STRAHMAN VALVES, Inc.

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James P. Shenfield becomes assistant to the president at Campbell Soup Co.

Dr. Majel M. MacMasters, Kansas State Univ., received Thomas Burr Osborne Medal at American Assn. of Cereal Chemists' annual meeting.

Industry

General Mills formed new Specialty Products Div., a combination of former Oilseeds and Special Commodities Divisions.

Burry Biscuit Co. has acquired control of Cal Ray Bakeries, Inc., through stock exchange. New affiliate will become Western Div. of Burry.

The Seven-Up Co. won court decision against Green Mill Beverage Co., producers of One-Up, in trademark protection battle.

Anheuser-Busch, Inc., recently dedicated its new half-million dollar New Orleans table syrup plant.

Beatrice Foods Co. has gained control of Adams Corp., Beloit, Wis., manufacturer of snack food line.

National Dairy Products Corp. announced acquisition by its British subsidiary, Kraft Foods, Ltd., of Southern Oil Co., Ltd., edible oil refiners of Manchester, England.

Gorton's of Gloucester and Fishery Products are expected to enter merger agreement in near future.

American Molasses Co. acquired all outstanding capital stock of Food Products Corp. through exchange transaction.

California Packing Corp. is planning expansion of canning operations into Italy.

Circus Foods, manufacturer of canned nut products, has become a wholly-owned subsidiary of United States Tobacco Co.

Associated Industries

International Flavors & Fragrances has acquired Kerr Fruit Concentrates, Inc., Portland, Ore.

Food Machinery & Chemical Corp. established a foreign subsidiary for operations in Japan.

Container Corp. of America is establishing a plant in Houston for manufacture of corrugated paperboard packaging products.

Richard L. Moore has been appointed director of public relations for W. R. Grace & Co.

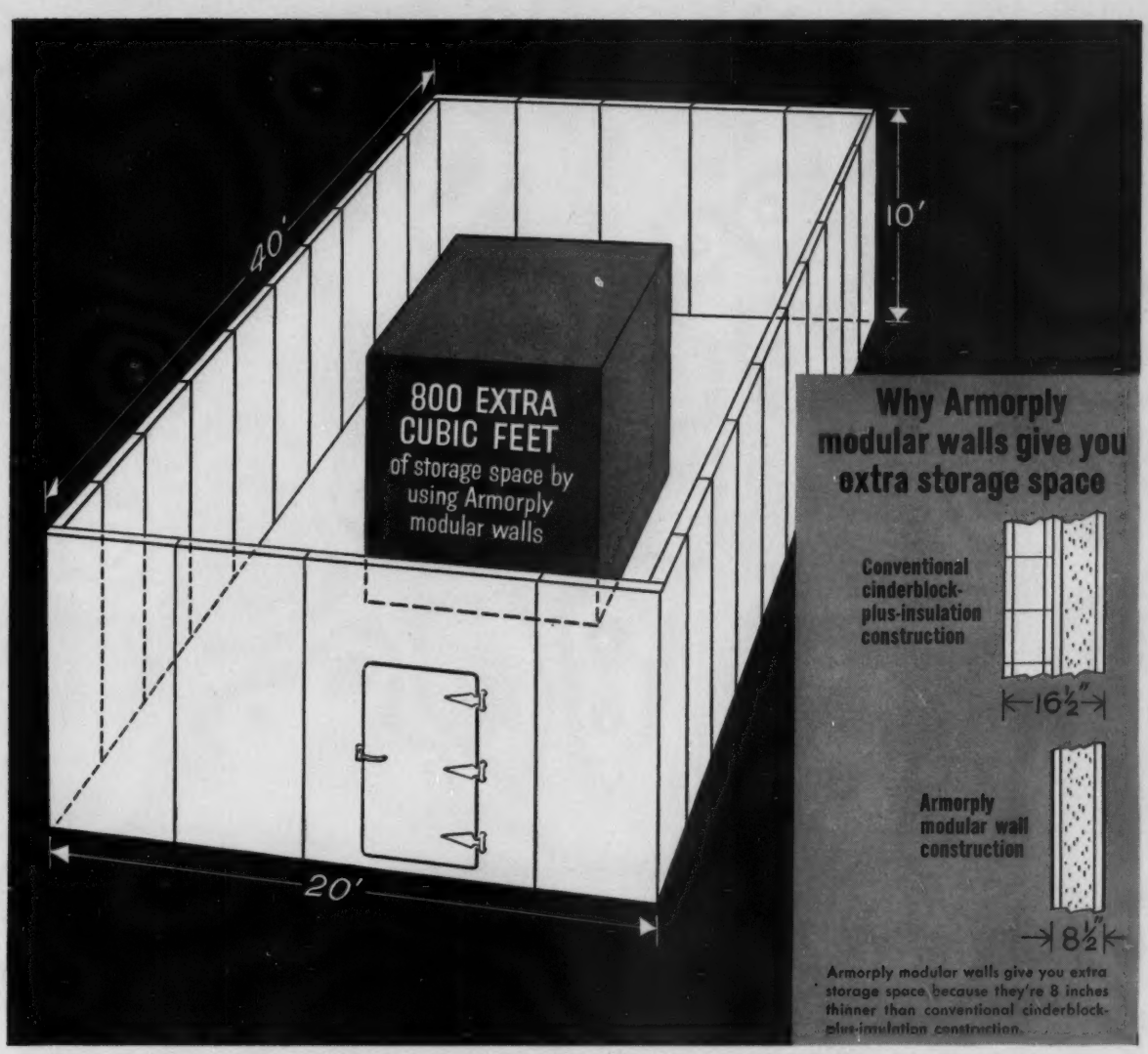
Amboy Sterile Packaging Co. will begin research, development, and custom packaging work in high temperature, short time processing and aseptic canning.

Aluminum Company of America plans production of unprinted foil in combinations with paper, wax, paperboard, and plastic materials for printers, package makers, and users.

W. L. Rutowski takes over as board chairman at R-C Can Co.

Celanese Polymer Co. has developed the first commercial process for making a new line of high-density polyethylene resins offering greater toughness and processing versatility.

NABISCO'S NEW CHICAGO BAKERY (Outlined in foreground) will be built adjacent to company's present plant and is expected to be in operation by the end of '62 when its five 300-foot long ovens are in full production.


40'
10'
800 EXTRA CUBIC FEET
of storage space by using Armorply modular walls
20'
Why Armorply modular walls give you extra storage space
Conventional cinderblock-plus-insulation construction
16½"
Armorply modular wall construction
8½"
Armorply modular walls give you extra storage space because they're 8 inches thinner than conventional cinderblock-plus-insulation construction.

In this room the space gained represents an extra 10% capacity. Smaller rooms provide proportionately greater space gains—13%, for example, in a 20' x 20' x 10' room. And there are comparable savings in higher temperature rooms.

More usable freezer storage space—with Armorply modular rooms

Indoors or out, in any sized freezer room at any required temperature, you gain many valuable cubic feet of usable storage space with Weldwood® Armorply® sectional walls – because they're so much thinner than ordinary cinderblock-plus-insulation construction. Yet the superb insulating and reflecting properties of Armorply modules let you maintain constant temperatures as low as –100°F, making it easy and economical to comply with new sub-zero storage standards.

Armorply rooms go up fast and easy. They need no costly masonry, no complex foundation. Just erect them on concrete slabs. They create no mess and assemble fast, too–because Armorply modules, as prefabricated by the Freezer Box Division of the Annapolis Yacht Yard, Annapolis, Md., have a patented, joint-locking device which makes for easy joining and eliminates sealing problems. This simple construction and fast erection mean a low total cost. Also make it easy to expand or move an Armorply freezer room.

Long-range benefits, too. Armorply metal-faced plywood modules require no painting, no maintenance. They're resistant to water, dirt, and vermin. Armorply modules come faced with aluminum, stainless steel, or zincbond steel. For a free sample and full details mail the coupon today.

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☐ Please send me a sample of Armorply and the descriptive booklet #2133 on Armorply cooler and freezer rooms.

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new equipment & supplies

Hot-Melt Adhesive System Offers Many Benefits

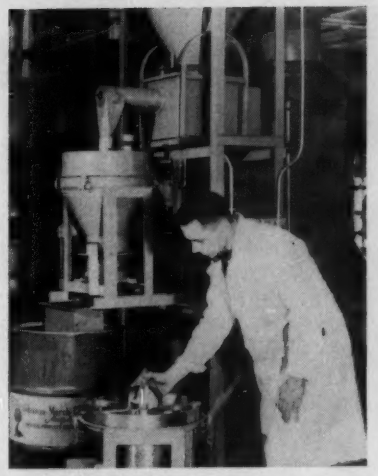
A new granular hot-melt adhesive system reportedly exploits the full potential of thermoplastic adhesion for the first time.

Known as Instant Lok, system consists of a hot-melt which is placed in a hopper and pre-melted by passage through a heated extrusion unit. It is then applied to the surface to be adhered through specially designed nozzles. Use of 100% solids material eliminates the cost of solvents, also cuts container costs, transportation charges and storage space. System enables rapid startup, eliminates the need for space-consuming drying and compression units as well as daily machine cleanup.

Its applications include making of bags and multiwall sacks, carton forming and sealing. Adhesives are available in a variety of specially tailored formulations.

System provides complete freedom from oxidation caused by exposed heating of adhesive, and eliminates the need for conventional pre-melt equipment. Adhesives used will neither support mold nor deteriorate during storage.—*National Starch & Chemical Corp., New York City.*

Circle 401 on Inquiry Card



DISTRIBUTING CONE of continuous unit provides complete particle coverage.

SANITARY construction eases cleaning. Cone and blades are readily accessible.

Adds Liquids to Solids Stream

Precise control in continuous addition of a liquid to a finely-divided stream of solids is offered by this unique product conditioner. Moreover, there is no degradation of the solid.

Compact and sanitary, unit (Verticone) provides efficient means for: (1) Introducing a specified moisture content, (2) color identification, (3) coating finely-divided granules or flakes, and (4) making a solid stream dust-free.

Unit operates without tumbling, folding, or mixing the material to be treated. Instead, it depends on controlled wetting of all surfaces of each particle. Liquid content can be adjusted from a fraction of 1% to any desired amount. Three standard units process between 150 lb. and 150 tons of material per hr.

Conditioner consists of a body shell, top housing, distributing cone, spray holder, blades, rotary discharge table, and drive. It has access doors for easy cleaning, and parts subject to wear are readily replaceable.

In operation, material fed onto the distributing cone at top of unit drops over the cone and leaves in the form of a thin-walled hollow cylinder. Simultaneously, sprays inside the hollow cylinder of falling material apply the liquid which coats all product surfaces.

Treated material can drop directly onto a chute, conveyor, into other process equipment, or be discharged by the rotary table feeder. Liquid can be applied at any point in the process—storage-bin discharge, conveyor-transfer points, packaging stations, etc.

Material flow must be controlled to within ±5% to maintain precise liquid addition. Standard dispensing equipment will handle liquids with viscosities near that of water, Heavier liquids, even fats, can also be processed if heat may be applied to reduce viscosity.

Two or more liquids can be mixed in ratios as large as 1,000

SERVICE CENTER

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to 1 and then dispensed through the unit. This is accomplished in a proportioning pump that injects individual liquids into a mixing chamber simultaneous with flow of the mixture to the spray jets. —*Johnson-March Corp., Philadelphia.*

Circle 402 on Inquiry Card

Insulated Container Eases Handling of Frozen Food

Designed primarily for transportation and temporary storage of frozen foods, this highly insulative, sanitary container needs no refrigeration.

Unit is a "box-within-a-box" with the void between the two filled with 2½ in. of foamed-in-place polyurethane. Inner box is of aluminum, outer box is of steel. Tests indicate that the foam has over twice the efficiency of conventional insulation. In addition, it is permanently sealed between the metal walls, and does not deteriorate, absorb moisture, or settle.

Container measures 40x40x60 in., holds 39 cu. ft. of food, and is easily handled by lift truck or handjack.—*Avco Corp., Nashville Div., Nashville, Tenn.*

Circle 403 on Inquiry Card

FOR MORE INFORMATION...

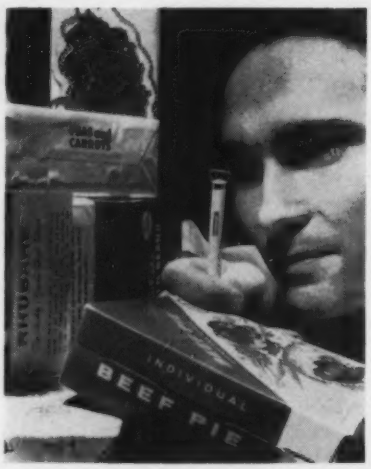
... simply circle key item number on handy Inquiry Card—back of book. Then print your name and address, and mail. For your convenience, these items are also listed and keyed in Reader Inquiry section.

Van's Compact Design Cuts Delivery Costs

Designed for lower-cost hauling of light or bulky loads, this forward-control delivery van features a 102-in wheelbase and overall length of 167 in. for easy handling in traffic or at loading docks.

Known as Step-Van 7, it is powered by an economical 135 hp., 6 cylinder engine. The half-ton chassis easily handles 1350-lb. payload in a 7-ft., walk-in body with 211 cu. ft. of cargo space. Independent front suspension and coil rear springs afford ride and cargo protection. Chassis is available to operators who wish to install special bodies—*Chevrolet Motor Div., Detroit.*

Circle 404 on Inquiry Card



Time-Temperature Unit for Frozen Foods

Tighter control of frozen foods in storage and transit is promised by this unique indicator.

Operated by electrochemical action, it records a frozen product's critical time-temperature history. Unit is about the size and shape of a cigarette, weighs only a fraction of an ounce, and is simply placed with food packages.

Time-temperature integration is an integral function, and combined information is shown on an easily read scale. Although the unit doesn't measure food quality directly, readings are consistent with USDA data on deterioration rates of various frozen foods at different temperatures.

A prime application is seen in inventory control, where readings could reveal the type of handling foods have received and indicate when laboratory quality checks should be made. Also, it could be used to determine which lots of food should be moved from inventory early because of the amount of quality reserve they have left.

The device has no moving parts, external wiring, or power sources, and requires no special calculations. Sealed in a plastic tube, it is durable enough to be packed with most frozen-food packages without additional protection. After use, it is discarded.

Heart of the unit is a glass tube filled with a special solution. Around this tube is wrapped a specially treated yellow paper sleeve. At the ends of the paper are two dissimilar metal electrodes connected by a copper ribbon.

In use, indicator is squeezed with

special pliers to break the capsule. This wets the paper and connects the electrodes. Resulting electrochemical action causes the yellow paper to turn red, beginning at one electrode and moving toward the other.

The speed with which color change occurs depends on temperature. And significantly, the red color's movement is always in one direction—cooling to a lower temperature slows its advance, but will not reverse its travel.

In the current model, which is being produced on a pilot basis for experimental use, the red zone moves full length of the scale in: About 20 days at 20F., two months at 15F., six months at 10F., and more than a year at zero. At 25F., the indicator travels full scale in a few days. — *Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.*

Circle 405 on Inquiry Card

Economical Heat Sealer Cuts Packaging Costs

Handling all gages of polyethylene, poly-coating kraft, and Pliofilms, a new low-cost heat sealer offers lower-cost packaging.

Known as Universal Sealer, the 4-way unit is made of cast aluminum and is cam driven. It features a safety slip-clutch and a heat-input regulator that controls to within ±2 deg. Sealing bar is of brass and is adjustable for leveling purposes. Teflon clip holders facilitate rapid changeover to seal polyethylene bags.

Unit is available in 8, 10, 12, 14, 16, and 18 in. models.—*Bag-O-Matic Packaging Equipment Co., Los Angeles.*

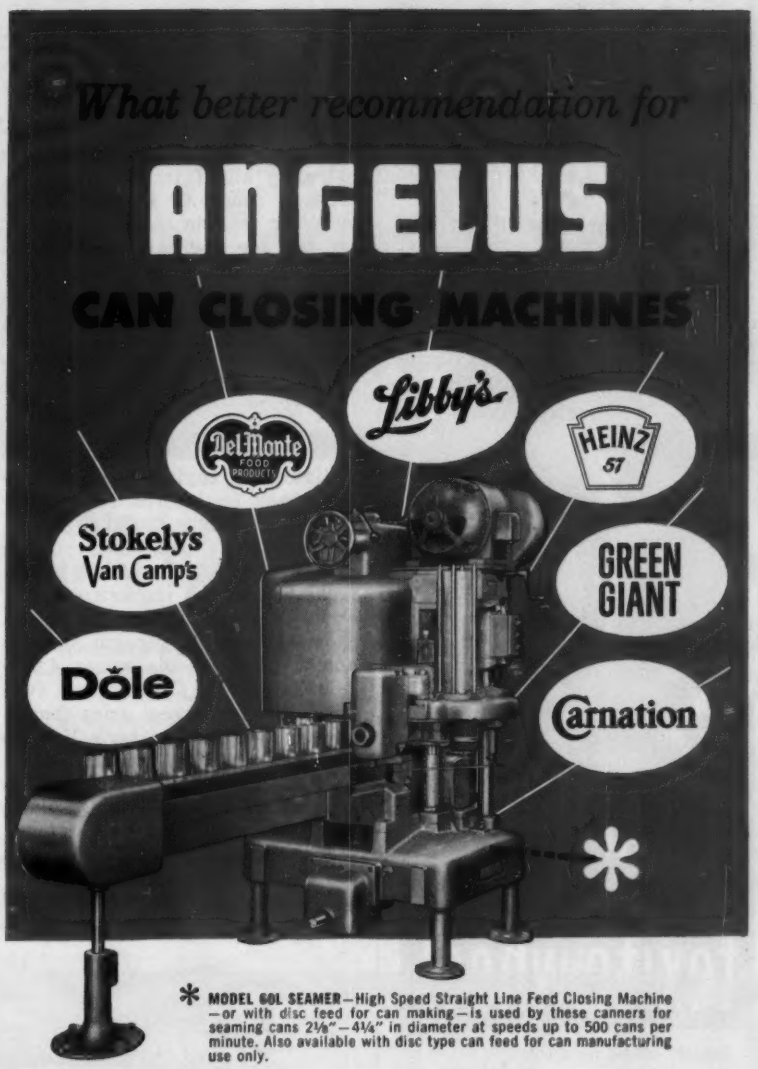
Circle 406 on Inquiry Card

Unique Water Treatment Offers High Bacteria Kill

A new silver ion water-sterilization process claims 40 times greater bacteria kill than regular chlorine water treatment—and without the unpleasant taste and odor often found in heavily-chlorinated water.

Equipment used in the process (Electro Dynion) is compact, easily installed, and operates on 110v. In operation, about 1/70th of the water to be treated is drawn out of the system and passed over six

(Turn page)



* MODEL 60L SEAMER—High Speed Straight Line Feed Closing Machine—or with disc feed for can making—is used by these canners for seaming cans 2⅛"—4¼" in diameter at speeds up to 500 cans per minute. Also available with disc type can feed for can manufacturing use only.

Canners and can makers the world over need...even demand the ultimate in simplified, rugged, efficient design. These demands are met by Angelus...the nation's only manufacturer exclusively producing automatic can closing machines.

Angelus seamers, backed by over 45 years of experience, are rugged and dependable; they are simple to operate and maintain; they represent the lowest possible initial investment.

WRITE TODAY for complete details. Specify products, can dimensions and your capacity requirements.

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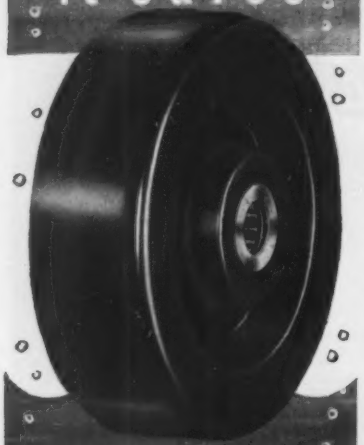
it wears
it saves



it's ALBION'S
WATER RESISTANT
texite wheel

Specially molded for applications requiring unusual water or chemical resistance . . plus the usual quiet, long-wearing, easy rolling-floor protective characteristics of Albion Texite Wheels.

These tough, high capacity wheels are immediately available from stock in **any** practical size from 3¼" to 16" diameters, tread widths from 1½" to 4" and capacities up to 8000 pounds. Plain, roller or sealed bearings. Price? Exactly the same as comparable models in Albion's **regular** Texite wheel line!

Specify "Low Water Absorption Texite Wheels" on your next caster or wheel order . . . and save.

FREE CATALOG — Albion's big, new 44-page catalog of Industrial Casters and Wheels is ready for your use and convenience. Write for your personal copy — Today!

ALBION INDUSTRIES INC.
ALBION, MICHIGAN

Equipment & Supplies (continued)

silver electrodes, which release a heavy concentration of silver ions. Resulting saturated solution mixes with the rest of the water and acts to purify all of it. Concentration of silver used—.02 to .03 ppm.—is not toxic to humans or animals.

Operating costs are cited as low because equipment is fully automatic and needs no special maintenance.—*Sharf Mfg. Co., Omaha, Neb.*

Circle 407 on Inquiry Card

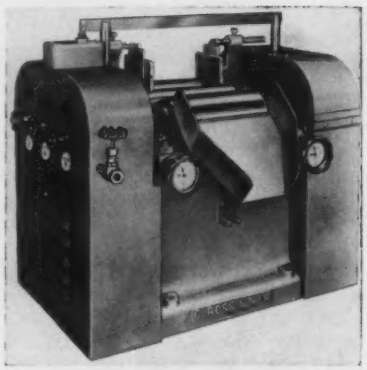
Light-Duty Truck Line

Significant engineering advances have been engineered into a new line of light-duty trucks.

Called the C-line, units offer a new 'low profile' with overall height reductions of 3-5 in., new exterior styling, longer wheelbases, and a choice of new suspension systems and frames. Models range 4,200-8,800 lb. GVW. Conventional two-wheel and four-wheel drive chassis are included, and maker's V-8 engines are standard for all models.

Valve-in-head, 6-cylinder engines with gasoline or liquefied-petroleum-gas fuel systems are optional. —*International Harvester Co., Chicago.*

Circle 408 on Inquiry Card

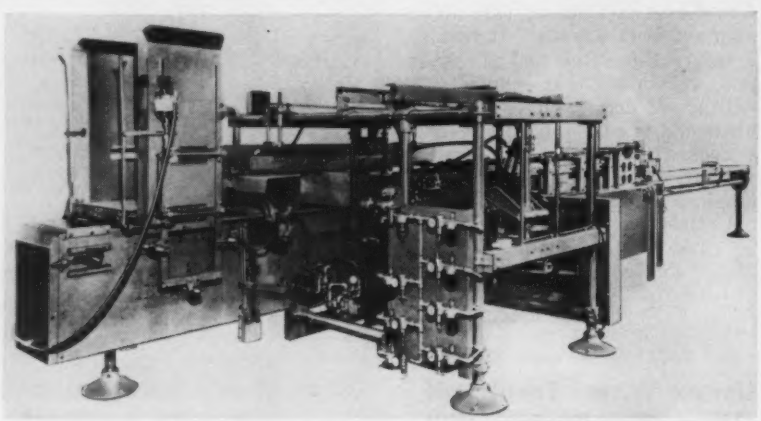


Instrumented Roll Mill

Roll pressure recording gages and thermostatically controlled water inlet valves on this high-speed, 3-roll mill offer precise control of roll adjustment and temperature for producing the finest dispersions.

Gages built into each adjusting handwheel provide positive parallel roll settings, eliminate uneven wear on rolls. They enable returning to predetermined roll settings without guesswork. Mills ranging 4½x10 in. to 16x40 in. have thermostatic control that limits roll temperature between 40-180F.—*Charles Ross & Son Co., New York City.*

Circle 409 on Inquiry Card



Advanced Unit Sets Up, Packs 25 Cases/Min.

Two exclusive features are offered in this new automatic case set-up and packing unit—a pneumatic 3-line divider and a feathered pusher for loading. Machine is engineered for continuous production of 25 cases per min. without an operator.

In operation, cans are fed in a single line and pneumatically positioned in the proper lane. Lockouts permit cans to accumulate in each lane, then cans are loaded by a feathered pusher permitting immediate infeed of next case. All operations are interlocked electrically. Unit is adjustable to pack gallon and 5-qt. cans into end-opening cases and handles all cases of standard specifications.—*A-B-C Packaging Machine Corp., Clearwater, Fla.*

Circle 410 on Inquiry Card

(Continued on Page 104)

DEGREASING BOX (W. D. Adam Co., Los Angeles)—Rugged, light, and durable. Unaffected in normal cleaning with degreasers like Trichloroethylene . . . won't corrode.

INPLANT STORAGE (Como Plastics, Columbus, Ind.)—Designed for food industry . . . injection molded, 18-gal. container that's easily washed and easily sterilized.

MILK CASE (St. Regis Paper, Panelyte Div., N.Y.C.)—Weighs only 4¾ pounds: tough and durable, non-absorbent, and odor free . . . designed for safe stacking.

CUTLERY CANISTER (Bloomfield Industries, Chicago)—Lightweight, and unaffected by harsh detergents and boiling water. Shown with counter holder also made of MARLEX.

Tote . . . ship . . . store . . . trust MARLEX* to do the job better!

Today, shipping, handling, and storing problems in every phase of industry and commerce are being solved more efficiently and economically with containers made of MARLEX. Units like the multi-purpose tote boxes, storage and shipping cases, flats, and containers shown here possess outstanding physical properties when made of MARLEX. They are virtually indestructible—tough, durable, lightweight . . . and resistant to denting, cracking, acids, alkalies, oil, greases, biological rot and corrosion. They withstand temperatures from —180°F to 250°F and can be steam sterilized.

A wide variety of economically priced shipping, handling, and storing units made of MARLEX high density polyethylenes and ethylene copolymers are readily available. Special units, designed to your needs, can also be fabricated at a reasonable cost. For further details, see your materials or food handling supplier, your plastic fabricators . . . or contact us.

*MARLEX is a trademark for Phillips family of olefin polymers.

GALLON CONTAINER (Industrial Plastics, Blue Springs, Mo.)—For thousands of industrial and commercial uses . . . from syrup to acid. Lightweight, unbreakable, and shippable.

RE-USABLE SHIPPING CONTAINER (Thermo-Plastic Products, San Carlos, Calif.)—For missile components. Here, MARLEX provides maximum protection with low weight.

PICKING BOX (Pioneer Products, Tucson, Ariz.)—Lightweight, non-absorbent, nesting and stackable . . . resists denting, won't crack. MARLEX means low cost and longer life.

Look for the MARLEX label! It's your assurance of quality and durable performance.

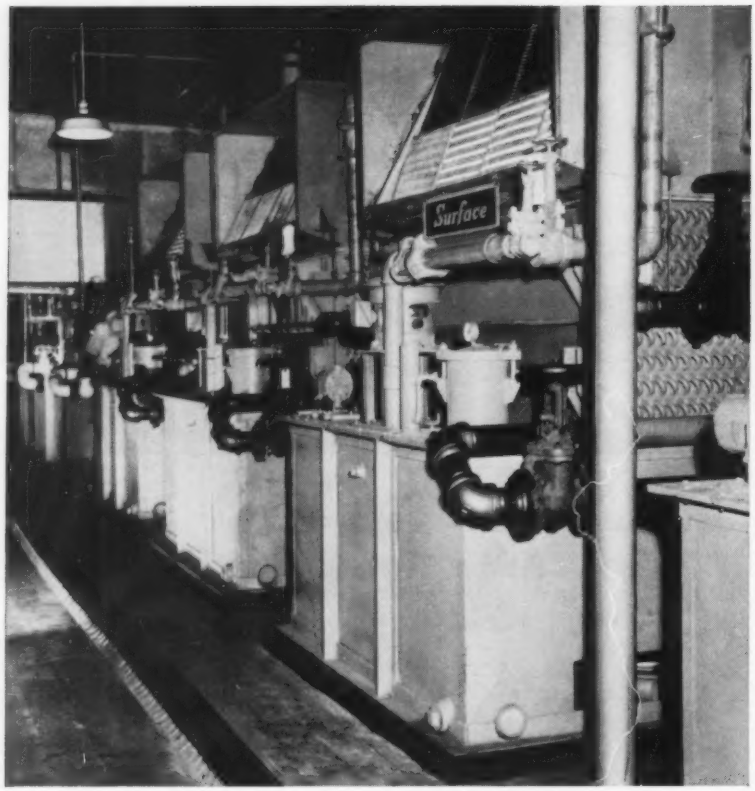
PHILLIPS CHEMICAL COMPANY

Bartlesville, Oklahoma

A subsidiary of Phillips Petroleum Company

PHILLIPS 66 MARLEX

CIRCLE 103 ON INQUIRY CARD



120 GRAINS CUT TO 45 IN 200,000 cfm OF AIR WITH 85° TOWER WATER

Without Kathabar, this job would have taken 1800 tons of refrigeration, at about 35F and reheating air from about 45F to 98F! With Kathabar the job took 63 hp instead of 2000. Ask the men who have seen Kathabar Type C units serve for years with practically no maintenance. Write for specific information.

Surface

SURFACE COMBUSTION

Division of Midland-Ross Corporation

2382 Dorr St., Toledo 1, Ohio

Send facts on Kathabar systems for the following application:

name and title.....

company.....

street.....

city.....*zone*.....*state*.....

Equipment & Supplies

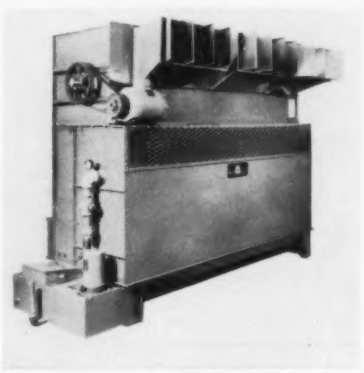
Versatile Teflon Packing

Cost of this Teflon-impregnated braided packing has been substantially reduced by a new production technique.

Designated Style 5875, the white asbestos packing contains more than 30% Teflon by weight. Applications include rotary and centrifugal shafts, valve stems, expansion joints, reciprocating rods, plungers, and rams. It can be used at temperatures ranging −90 F. to 500 F., and its low coefficient of friction reduces wear on packing and mechanical components.

Packing is unaffected by moderately destructive and corrosive minerals acids and caustics.—*Garlock Inc., Palmyra, N. Y.*

Circle 411 on Inquiry Card



Efficient Spray Cooler

Designed for efficient room cooling and blast freezing, this unit chills the air by passing it across sprayed coils in which a refrigerant is expanded.

The sprays, either brine or a special non-corrosive liquid (No-Frost), prevent ice formation on coils. With the latter, solution is automatically re-concentrated so

Continued on Page 106

FIRMENICH & CIE.
SUCCESSEURS DE
CHUIT NAEF & CIE.
GENEVE SUISSE ®

IMITATION VANILLA BEAN FLAVOR BY FIRMENICH

Vanilla Bean Flavor by Firmenich stems from the vanilla bean. By original research, its components and desirable characteristics have been isolated, identified, and synthesized. By patient and painstaking laboratory techniques, they have been reconstructed for you in a precise and potent flavor material with all the aromatic qualities of the original.

Vanilla Bean Flavor by Firmenich comes to you as an economical replacement of pure vanilla extract, of pure vanillin, or to use in combination in the manufacture of all products that you flavor with this most popular of flavors. Contains no coumarin.

CIRCLE 105 ON INQUIRY CARD

FIRMENICH INCORPORATED
NEW YORK : 250 WEST 18TH STREET, NEW YORK 11
ILLINOIS : 5422 NO. MILWAUKEE AVE., CHICAGO 30
CALIF. : 1416 CRESTVIEW COURT, LOS ANGELES 24

FIRMENICH OF CANADA, LIMITED
ONTARIO : 350 WALLACE AVE., TORONTO 9
QUEBEC : 2323 GRAND BLVD., MONTREAL

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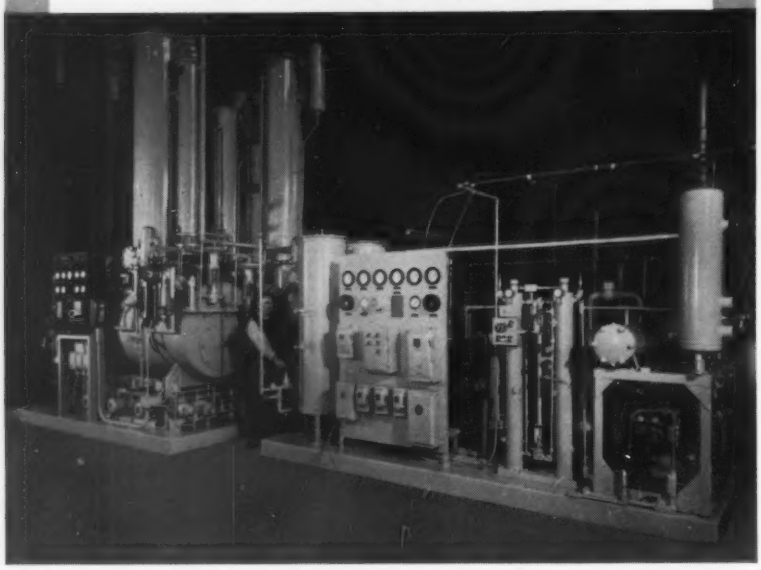
DeMARKUS

packaged

CO_2 AND NITROGEN MANUFACTURING SYSTEMS

for all food industry needs



The economical way to meet your constant demand for pure CO_2, dry ice and nitrogen

Food plants everywhere are turning to the specialists of DeMarkus for the answer to a more practical and economical way of satisfying their constant demands for pure CO_2 and Nitrogen used in their processing operations.

Large users of CO_2 and N_2 can enjoy tremendous savings with DeMarkus Packaged Systems because the efficient process used reduces production costs to about 1¢ per pound for CO_2 and less than 2¢ per 100 SCF for nitrogen.

Compare these costs with your current total expense for purchased gas and you see why more and more economy-minded, profit-wise food producers are buying DeMarkus Packaged Systems!

Standard DeMarkus Packaged Systems produce 50 to 500 lbs. of CO_2 per hour, 2800 to 28000 SCFH of nitrogen. Large-size custom-built plants are also available.

Let us send you complete information--even make a complete cost study for you--at no obligation. Write today.

DeMarkus also produces inert gas and hydrogen plants.

WRITE TODAY FOR DETAILS

LOUIS DeMARKUS CORPORATION
and DeMARKUS INTERNATIONAL CORPORATION
(Western Hemisphere outside U.S.A.)
Specialists in Gas Manufacturing and Purification Processes
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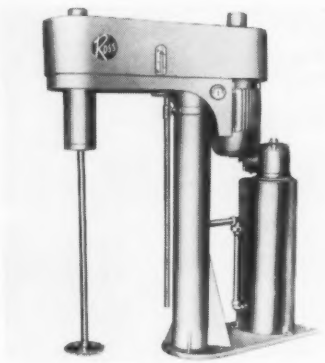
system is fully automatic. Finned coils are used for increased heat transfer and higher capacity, of particular importance when temperatures below 0F. are required. Higher heat-transfer efficiency also permits narrow spread between room and refrigerant temperatures, providing high humidities to protect foods from drying out, shrinking, or discoloring.

Designated Niagara Series 3900, coolers' air capacities range 2,100-2,400 cfm. Cooling capacity ranges 1,660-15,700 BTU/hr. per degree temperature difference between entering air and refrigerant temperature. Eight units are available. each with choice of four and eight row coils in finned surface; or eight, ten, and twelve row coils in prime-surface models—*Niagara Blower Co., New York City.*

Circle 412 on Inquiry Card



High-Speed Disperser

Advanced impeller design of this high-speed unit enables efficient mixing and dispersing of products with medium or heavy-paste consistency (up to 60,000 cps.)

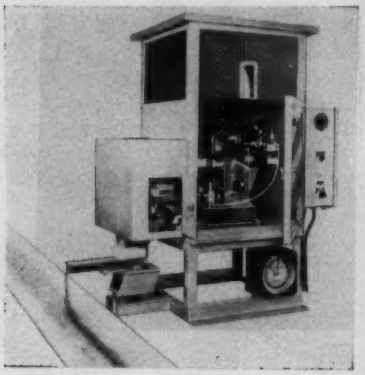
Impeller is a high-impact multiple-action millhead with specially machined internal chambers. In operation, material is first subjected to direct impact and abrasive action within the millhead. Then it is jetted out in thin streams from the slow-moving surrounding material for greater attrition and hydraulic shear.

Called Model #140DI, unit handles batches ranging 100-800 gal. Variable-speed drives up to 60 hp. permit shaft speeds of 600-3,000 rpm.

Disperser centers in tanks up to 6-ft. dia. An automatic hydraulic cylinder permits raising from tanks up to 6-ft. deep. Unit's 360-deg. swing enables tanks to be grouped

around the column for continuous use.—*Charles Ross & Son Co., New York City.*

Circle 413 on Inquiry Card



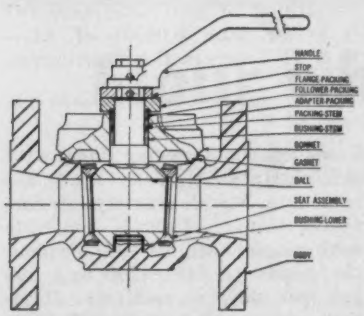
Improves Additive Feeding

Designed for precision weighing of free-flowing granular solids, this unit offers improved means for feeding dry additives in continuous-flow systems.

In operation, scale with over-and-under indicator weighs precise amounts in hopper. Air-operated device then dumps additive into second hopper which, in turn, supplies vibratory feeder.

Unit handles quantities from 1 oz. to 10 lb. Machines can be arranged as single production units, or electrically synchronized with discharge chutes delivering product through a single spout.—*Exact Weight Scale Co., 538 E. Town St., Columbus, Ohio.*

Circle 414 on Inquiry Card



Sanitary Ball Valve

Cleaning ease, Teflon seats and seals, and top entry for easy maintenance are features of a new line of stainless-steel ball valves.

Removal of bonnet flange permits easy access to ball and seats without removing valve from line. Unit

(Turn page)

The big PLUS SERVICE EXPERIENCE RESEARCH PERFORMANCE in Oakite

How an Oakite Coordinated Sanitation Program can reduce sanitation costs for you

An Oakite Coordinated Sanitation survey of your plant gives the same effect as adding a sanitation expert to your maintenance staff —except in one respect. It doesn't cost a cent. It *does* do this:

1. *It is virtually guaranteed to cut your total plant sanitation cost.*
2. *It keeps your equipment at top operating efficiency . . . prolongs its productive life.*

A Coordinated Sanitation survey is simply an experienced and expert over-all view of everything involved in plant sanitation. It shows you economies on materials . . . reduces the number of types you need . . . points out where it will pay you to *mechanize* cleaning . . . details the savings in cleaning crew time and toil. And it's programmed to provide maintenance cleaning *before* trouble occurs.

In his survey of your plant the Oakite man would cover such jobs as produce washing, conveyor chain lubrication, use of mechanized cleaning equipment, brightening stainless steel equipment, cleaning of pasteurizers, evaporators, stills, cookers, filling equipment, etc., end-of-season clean up, odor control, truck washing, floor washing.

The big PLUS in Oakite

Just one of the plus factors you get with Oakite materials, the Coordinated Sanitation survey combines the experience of the entire Oakite organization, and the latest cleaning research. It's accomplished by a man who really knows his business—and a lot about yours, too. To learn more about it, call your local Oakite man today, or write for Bulletin. Oakite Products, Inc., 26G Rector Street, New York 6, N. Y.

OAKITE

over 50 Est. 1909 SCIENCE years' leadership in industrial cleaning

Technical Service Representatives in Principal Cities
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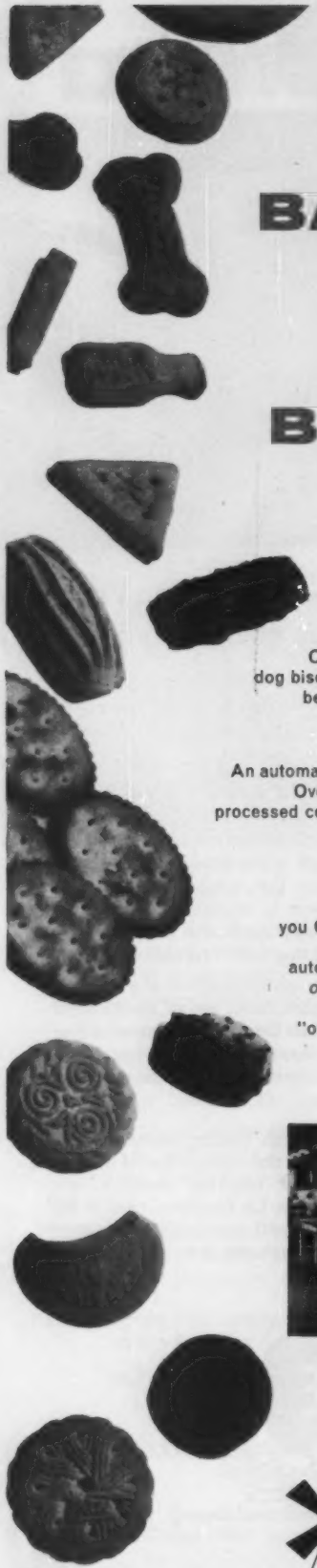
CIRCLE 107 ON INQUIRY CARD

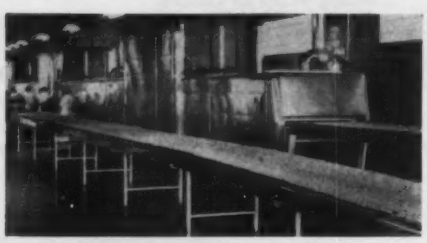


WERNER BAKED IS BETTER BAKED

Cookies . . . snacks . . . crackers . . . pretzels . . . dog biscuits . . . cereals . . . whatever the product may be, if one step of production involves BAKING, you can bake it BETTER with efficiency-engineered WERNER equipment!

An automatically controlled WERNER Recirculating Heat Oven assures just the right touch of toasting for processed cereals, for instance. And WERNER engineers can deliver toppers, choppers, sprayers or enrobers, precision coordinated to deliver high volume production.

If your product is baked—*in part or in total*—you CAN bake it better, faster, more economically with a WERNER Oven! Recirculation of automatically "conditioned" heated air *within the oven* cuts fuel costs up to 50%, speeds baking time, eliminates the need of a full-time "oven man" . . . and reduces waste by assuring uniform quality of baking *without variance in flavor or texture!*



FIND OUT HOW YOUR PRODUCT can benefit from the precision engineering that has created the highest efficiency band oven in the industry. WRITE FOR ILLUSTRATED FIELD REPORTS.

erner achinery Company

1765 ALPINE, N.W., GRAND RAPIDS 4, MICH., U.S.A.

Equipment & Supplies

can be backwashed with solutions or steam to 400F., and seat can be adjusted by simply tightening two hex nuts on the bonnet.

Instead of being 'floated', ball is fixed between top and bottom guides to withstand shock and impact without distortion or back lash. This also provides effortless, fast action with low torque. A 90-deg. turn of a relatively short handle opens and closes the valve. Position of handle indicate whether valve is open or not.

The 150-psi. valve is available in ⅛ in. dia.—*Hydromatics, Inc., Bloomfield, N. J.*

Circle 415 on Inquiry Card

Sanitary Screens (Rotex) with new frame design maintain constant tension in two dimensions on all types of screen clothing. Available in wide range of sizes for wet and dry screening.—Orville Simpson Co., Cincinnati.

Circle 416 on Inquiry Card

Continuous Casing Stuffer for comminuted meats provides air-free emulsions, enables three men to produce up to 10,000 lb. per hr. Unit with open hopper is powered by a 10-hp. vari-drive motor.—De Laval Separator Co., Poughkeepsie, N. Y.

Circle 417 on Inquiry Card

Process Refractometer provides electrical output indicating difference in refractive index of two fluids contained in separate instrument cavities. One or both fluids may be flowing or stagnant. Sensitivity of unit (Refractosyn) is better than 0.00001 of RI.—H & H Controls Co., Burlington, Mass.

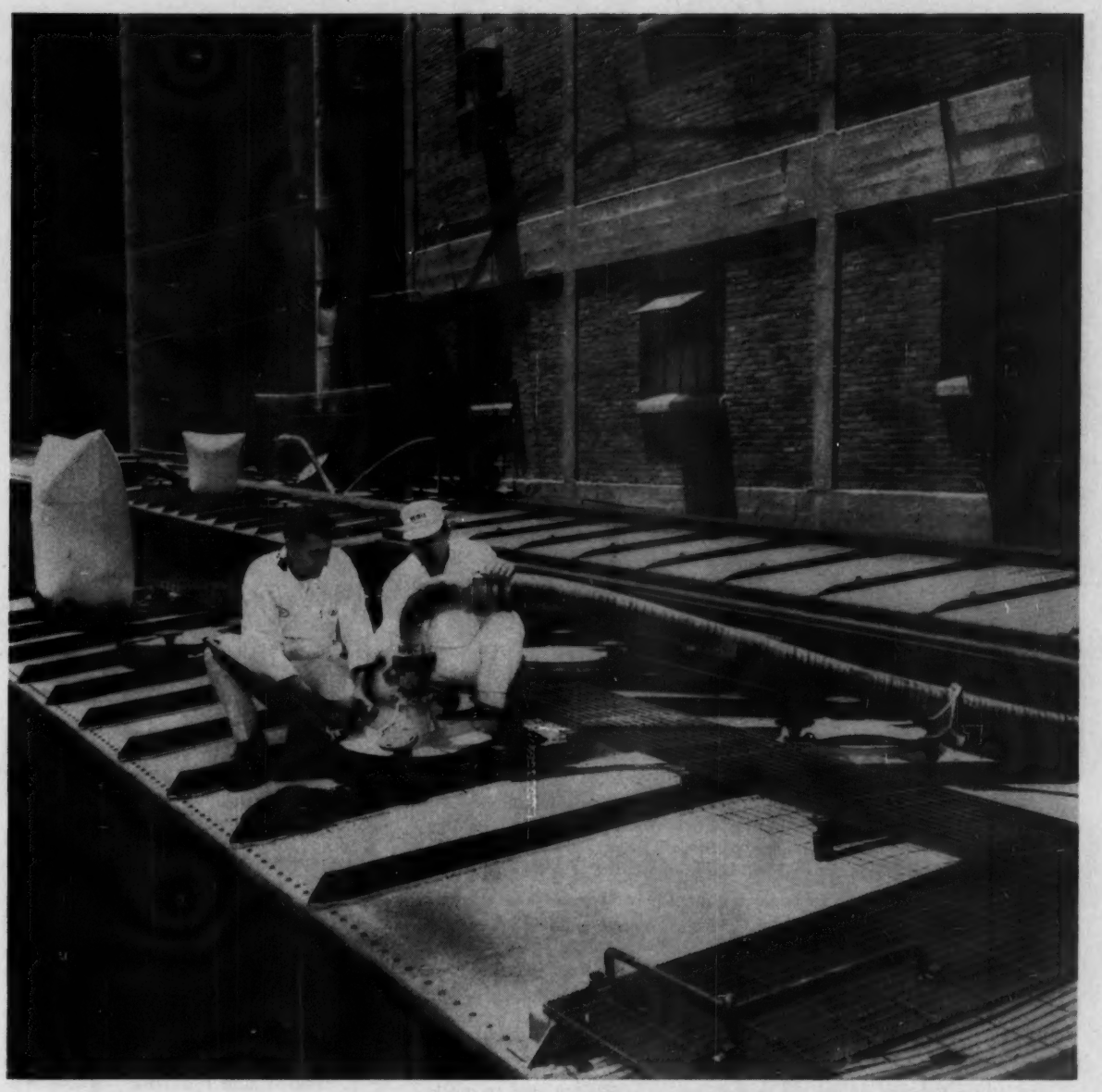
Circle 418 on Inquiry Card

Low-Capacity Metering Pump with interchangeable plastic heads accomodate a wide variety of corrosive liquids. Unit is available with single head (A-747) or double heads (A-748)—250 and 500 gal. per day, respectively. Maximum pressure is 100 psi.—Wallace & Tiernan Inc., Belleville, N. J.

Circle 419 on Inquiry Card

Recording Thermometer provides permanent in-transit record of refrigerated-compartment temperatures ranging —40 to 20F. Unit has 7-day circular chart, is

(Continued on Page 110)



Flour whooshes through hose and saves a bakery $250

USING B.F.Goodrich hose, these men are loading a special railroad car with flour at an 800-pound-a-minute clip. Every car loaded this way saves some bakery the $250 extra it would cost to deliver the flour in 100-pound bags. Using hose, it takes only 3 hours to load a car.

To make this "filling station" method practical, B.F.Goodrich engineers came up with a special lightweight hose that's easy to pull around and won't flatten or kink on sharp corners. Workers say that this hose is a cinch to operate. Just hook it to a hatch, turn on the blower, and let the car fill.

Special hose for flour is only one of the many products developed for food processors by B.F.Goodrich. Others include mildew-resistant and grease-defiant conveyor belts, rigid vinyl pipe acids can't ruin, and washdown hose, steam-cleaning hose, and beverage hose.

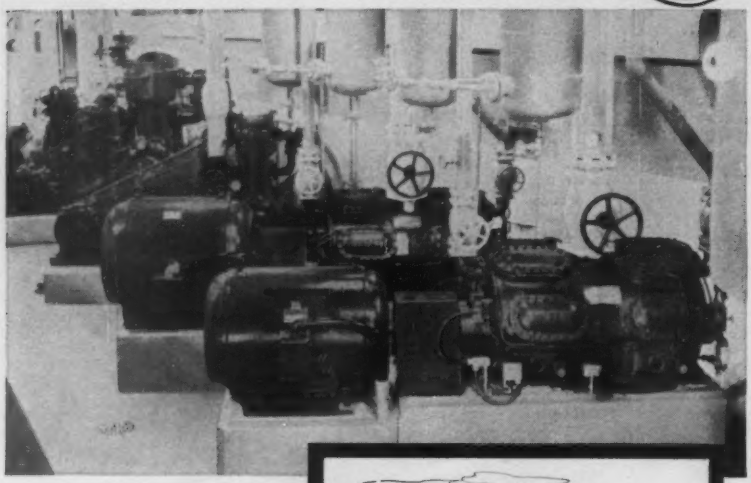
To get all the facts about BFG products, call your B.F.Goodrich distributor. As a factory-trained specialist in rubber products, he can help you select the right product for the specific job to be done. *B.F.Goodrich Industrial Products Company, Dept. M-987, Akron 18, Ohio.*

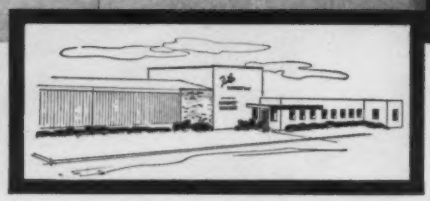
B.F.Goodrich

Cold Turkeys are Hot Sellers when Vilter Refrigerated

Norbest

Faribo Turkeys, Inc., a Division of Norbest Turkey Growers Association, Faribault, Minnesota.





Partial view of Faribo engine room showing two 16-cylinder VMC high pressure compressors in the foreground and one each 7½ x 7½ and 13½ x 10½ vertical compressors. Other Vilter compressors are located on the balcony. Inset shows exterior.

Special refrigeration know-how marks *every* Vilter installation. The Vilter equipment installed at Faribo Turkeys, Inc., is a good illustration of this. Here the quality and flavor of prime turkeys are preserved with rapid freezing to build demand and bring top market prices.

At Faribo they operate some ten months of the year and at times approach a maximum processing total of 250,000 pounds of turkey per day—over 16,000 birds. This amount of processing requires the best in reliable refrigeration. And this Vilter helps provide.

Vilter is well represented at Faribo: two 16- and one each 4- and 8-cylinder VMC high-pressure ammonia compressors, and an 8-cylinder VMC and two Vilter vertical booster compressors; three 24-ton horizontal Pakicers; and shell and tube horizontal condensers.

Vilter Pakicers supply the crystalform, snow-like ice used to quick-chill freshly eviscerated turkeys prior to their being frozen.

Vilter refrigeration equipment does its job well—efficient, economical performance . . . low maintenance . . . long life. Vilter dependability results from careful design, quality material and prideful workmanship. As a final check, all Vilter compressors are thoroughly floor-tested to design requirements before shipment—good value for your investment dollar.

For more profit and greater satisfaction, let Vilter help you with your food processing refrigeration needs.

Vilter® refrigeration air conditioning

The Vilter Manufacturing Company
Milwaukee 7, Wisconsin

Air Units • Ammonia and Freon Compressors • Booster Compressors Baudelot Coolers • Water and Brine Coolers • Blast Freezers Evaporative and Shell and Tube Condensers • Pipe Coils Valves and Fittings • Pakice and Polarflake ice machines.

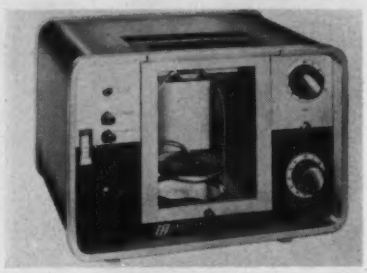
Write for helpful bulletins to The Vilter Manufacturing Company, Dept. E-613 2217 South First Street Milwaukee 7, Wisconsin

Equipment & Supplies

mounted on outside wall of carrier, and measures 10x9½x6 in.—Manning, Maxwell & Moore, Inc., Gauge & Instrument Div., Stratford, Conn.

Circle 420 on Inquiry Card

For the Lab



Gage Moisture Directly For Any Size Sample

By drying a sample with far-infrared energy and measuring its change in weight through torsion-wire rotation, this automatic moisture analyser calculates the final answer in percent moisture or percent solids on either light or heavy-density materials.

No specific weight of sample is required for the test, thus a sample can always be selected on the sole basis of proper size for efficient, rapid drying. Called IR, unit has a motorized heater-positioning control that moves the heater smoothly over sample at beginning of test and retracts to standby position at end of automatic drying period. This eliminates inaccuracy due to over or under drying.—*Moore-Milford Corp., Skokie, Ill.*

Circle 421 on Inquiry Card

Torsion Balance (DWL-5), of 500-gm. capacity, offers dial weight loading that eliminates all weights below 100 mg. Oil-damped unit gives rapid readings accurate to 50mg.—Torsion Balance Co., Clifton, N. J.

Circle 422 on Inquiry Card

Laboratory Mill efficiently disintegrates dry materials that are soft to medium-hard and do not exceed ⅝-in. grade. It handles quantities of 100 gm. to 44 lb. in single pass, also operates continuously.—Pallmann Pulverizers Co., Hoboken, N. J.

Circle 423 on Inquiry Card

STARCHES and SYRUPS

Keep your product in her cart ...week after week

Corn starches and syrups are time-tested, nourishing, economical carbohydrates. They've long been used and accepted as foods and food ingredients. They may be the answer to problems you have resulting from recent legislation regarding foods because:

In addition to being time-tested, nourishing, economical carbohydrates, corn starches and syrups can provide valuable functional properties as:

• Stabilizers • Emulsifiers • Binders • Humectants • Bland sweeteners • Texturizers • Preservatives (of natural body and color) • Thickeners (for consistency control) • Sugar Crystalization control • Coatings—Glazes

CORN STARCH is ideal for baking, baking powder, meats, mustard, salad dressing, custards, pudding, canned soups, etc.

CORN SYRUPS are used in mixed syrups, infant foods, preserves, jams, jellies, baked beans, sausage and cured meats, frozen and canned fruits, frozen deserts and many other products.

CORN SYRUP SOLIDS are widely used in ice cream, baked goods, frozen fruits, dry food mixes, jams, jellies, table ready and canned meats, to mention just a few.

Whatever you may be processing OK BRAND corn syrups or starches will help you keep your product in her cart week after week.

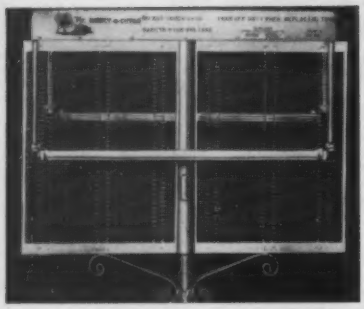
Call the Man from Hubinger ...his service is freely available. Write, wire or phone today.

THE HUBINGER COMPANY
Keokuk, Iowa

NEW YORK • CHICAGO • LOS ANGELES • BOSTON • CHARLOTTE • PHILADELPHIA

You can depend on HUBINGER... *fast shipment by rail... prompt delivery by truck*

Plant Sanitation & Maintenance



'Black' Light Unit Attracts, Kills Flying Insects

Effective control of flying insects is reported with use of this near-ultraviolet unit.

Called "Insect-O-Cuter," it consists of an electric grid, special transformer, and two 'black' lights. Latter attract most insects, which are then killed instantly on contacting the electrified grid. Power consumption is negligible and the weatherproof units require virtually no maintenance. Their life expectancy is said to exceed 20 yr.

Illustrated model, of welded-steel construction, is for outdoor use. It measures 55x41x6 in. and is mounted on a standard about 8 ft. above the ground. Units in screen form are also available to fit any window or door. Standard systems are wired for 110-115v., but can be supplied for 220v.—*Gardner International Corp., Pompano Beach, Fla.*

Circle 451 on Inquiry Card

Automatic Waste Disposal

Installed beneath work surfaces of trimming lines and food-preparation tables, new power-feed disposals offer efficient high-volume waste removal.

In operation, a worm-feeder moves waste to an integral grinder at a rate controlled to prevent overloading. Entire unit starts automatically when water valve is opened. Waste is then ground, slurried, and flushed to the sewer through a steel screen.

Disposals are available in 3- or 5-hp models. Also offered is a connecting chute that bolts to the table. —*Buffalo Hammer Mill Corp., Buffalo, N. Y.*

Circle 452 on Inquiry Card

Monolithic Epoxy Coating gives porous walls and ceilings an attractive, sanitary, and easy-to-clean surface. Tile-like product (Tile-X) is easily applied over concrete block, brick, wood, etc., and resists deterioration by steam, chemicals, and mold. — Steelcote Mfg. Co., St. Louis.

Circle 453 on Inquiry Card

Plastic Floor Finish is termed non-skid, fast-drying, and durable. Product (Skid-Not) is used on linoleum, asphalt, tile, wood, etc. —Monroe Co., Inc., Cleveland.

Circle 454 on Inquiry Card

Anti-Rust Protection for iron and steel surfaces is offered by a ready-mixed, zinc-filled coating. Self-curing material (Chem Zinc) forms an impervious, non-blistering film. — Truscon Laboratories, Detroit.

Circle 455 on Inquiry Card

Chromate Treatment (Hinac) curbs corrosion of steel, aluminum, copper, etc. Easily applied at room temperature by roller coat, dip, or spray.—Pennsalt Chemicals Corp., Philadelphia.

Circle 456 on Inquiry Card

New Food-Release Compound renders product - contact surfaces non-sticking, thus protects foods and eases cleaning of equipment. Known as Pam, it is available in aerosol cans and in bulk.—Gibralter Industries, Inc., Chicago.

Circle 457 on Inquiry Card

Liquid Plaster, incorporating epoxy resin, provides permanent coating for vertical masonry structures. Called Epo, it also guards tanks and process equipment against chemical corrosion. —George E. Fines, Inc., Detroit.

Circle 458 on Inquiry Card

Food Ingredients & Additives

Yeast-Protein Hydrolysate Has Many Applications

A mixture of flavorful, readily assimilable amino acids has been produced by splitting the whole proteins of food-grade Torula yeast. Similar preparations made from vegetable protein sources are finding widespread use in a variety of processed foods.

Known as Torula Yeast Hydrolysate, the product is specifically designed as an economical flavorant for processed foods in which a meat-like flavor is desirable. A 5% aqueous solution of the hydrolysate is said to have a flavor very similar to that of beef bouillon.

Product can be used as a liquid, a concentrated paste, or a dry powder. All forms are completely soluble in water to yield a clear solution with an attractive meaty aroma and somewhat salty and meaty flavor. Due to presence of salt, the hydrolysate is not suitable for specialty items used in salt-free diets. In normal usage, however, the salty note complements the product's meaty flavor.

Foods that benefit most by incorporation of the hydrolysed yeast include soups and soup bases, stews, gravies and sauces, canned meats, meat loaves, comminuted meats, chop suey, and chili.

(Continued On Page 114)

Typical Analysis of New Torula Yeast Hydrolysate

Total solids	65%
Salt (NaCl)	30%
Flavor solids	45%
Total nitrogen	6%
Free amino nitrogen	3%

The Importance of Logic in Dairy Machine Design

The most successful packaging machine is the most simple in concept. Unnecessary complexity always seems to tax itself in speed, performance, efficiency and maintenance.

Triangle originally entered the cottage cheese and salad filling field to develop methods for very high speed, gentle filling. No other consideration was allowed to complicate the basic requirements. That's why Triangle cottage cheese filling methods have been so successful for so many years.

What could be a more logical, starting place for developing a low-cost, fully-automatic cup filling machine of universal appeal . . . ?

NOW TRIANGLE HAS COMBINED DAIRY-PROVEN ROTARY DESIGN WITH ITS TIME-PROVEN CUP FILLER!

Regardless of whose cup filler you're using or whether you're presently considering purchase of equipment, you owe it to yourself to investigate the new Triangle DR-1 Rotary.

The reason? It has all the time-proven advantages of Triangle spiral cup dispensing, gentle filling and vacuum capping *plus* the compact dependability, and positive cup control of rotary operation —truly a low-cost, high-speed, fully automatic machine.

Briefly, here's why . . .

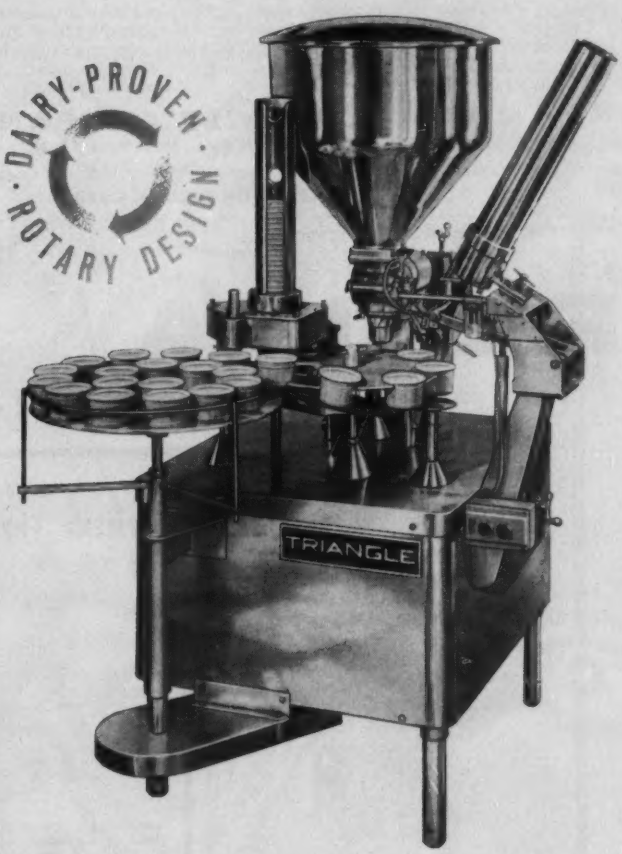
The low-cost Triangle DR-1 is fast . . . 60 to 70 one pound cartons per minute. Up to 50 on the two pound size!

The low-cost Triangle DR-1 is efficient . . . Positive, dairy-proven rotary control of cartons provides maximum results at highest speeds. The waste and unsanitary mess of tipping and spilling is no longer a problem.

The low-cost Triangle DR-1 sets unequaled sanitary standards—rugged, fully enclosed construction with stainless steel top and skirt encloses all drive mechanisms. Wash-up has been made easier and faster, because tools are not needed for disassembly—or even change-over!

The low-cost Triangle DR-1 is dependably automatic . . . The remarkable spiral cup dispensing, gentle filling and vacuum capping methods proved over the years on Triangle Cup Filling Machines have been combined in this dairy-proven rotary design.

See for yourself how far the new low-cost Triangle DR-1 has advanced automatic cup filling. Before you buy any cup filling equipment, get the facts on Triangle's new Dairy-Proven Rotary Design DR-1 by writing or calling today—without obligation, of course.



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D-1-61R1

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NIAGARA "no frost"

...DEPENDABLE and DURABLE

Experienced operating men will tell you that Niagara No-Frost refrigeration gives you the best results in food freezing, cold storage warehousing, fruit and vegetable chilling.

Especially in the tough spots, in such conditions as meat packing and crop pre-cooling, where there are large amounts of moisture and extra air-borne causes of corrosion, No-Frost equipment out-lasts, out-performs and out-saves all other types.

Because it PREVENTS all frost or ice formation from the start, Niagara No-Frost gives you always full capacity, prevents waste of power. You escape all trouble and labor of defrosting, have rooms that are always clean and sanitary, enjoy the lowest operating costs per ton of refrigeration.

For more than a quarter of a century Niagara No-Frost durable, dependable equipment has been making money for its users.

Write for Bulletin 105.

NIAGARA BLOWER COMPANY

Dept. FE-4, 405 Lexington Ave., New York 17, N. Y.

Niagara District Engineers in Principal Cities of U.S. and Canada

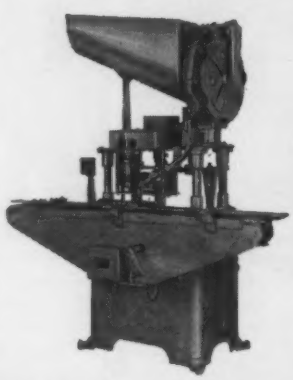
CIRCLE 138 ON INQUIRY CARD

RESINA

TOPS THEM ALL

fully automatic

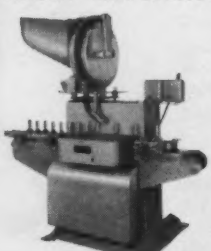
SCREW CAPPER



The RESINA line of CAPPERS include models for sorting, feeding and applying a great variety of caps to bottles, jars or cans from ½ ounce to gallons. Speeds available up to 120 per minute.

fully automatic

FITMENT APPLICATOR



Automatically selects plastic fitments (solid or perforated) with or without lift tabs and orients them into a chute. Passing container picks up fitment which is then snapped on the container. Speeds available up to 120 per minute or higher.

Descriptive literature and specifications on request.

RESINA AUTOMATIC MACHINERY COMPANY, INC.

572 SMITH STREET • BROOKLYN 31, NEW YORK

Ingredients (cont.)

Small samples of the hydrolysate, laboratory produced at present, are available for processors' evaluation. — *Red Star Yeast & Products Co., Milwaukee.*

Circle 466 on Inquiry Card

Lactic-Culture Technique Curbs Phage Infection

Air-borne phage infection of lactic starter cultures, a major problem in commercial cheese manufacture, is said to be eliminated by a new technique for preparing laboratory cultures and bulk starters. Special equipment used guards the culture from exposure to air and maintains absolute asepsis.

In operation, starter milk is placed in sealed containers which remain airtight during heat treatment, inoculation, and incubation. Inoculations are made through a special bacteriological seal with a surgical-type needle.

Starters thus produced have optimum acidity and offer precise quality control to eliminate bitter taste in cheese.—*B.E.P. Industrial Equipment, Detroit.*

Circle 467 on Inquiry Card

Cultured Butter Flavor enhances quality of variety of foods. Known as Butter Creme Imperial, it is finding wide application in candies, baked goods, icings, and chocolate products.—A. E. Illes Co., Dallas, Tex.

Circle 468 on Inquiry Card

Whey Solids may be used successfully at high levels in continuous dough making, according to recent tests. Product goes into solution instantly, develops doughs that machine smoothly, and provide flavor follow-through from brew tank to oven. Known as Valley Fresh, the wheys offer a favorable balance of lactalbumin and lactose.—Western Condensing Co., Appleton, Wis.

Circle 469 on Inquiry Card

Oleoresin Simulant is offered as complete replacement or extender for decolorized black pepper oleoresin. Called Pipersin No. 33333, it is composed entirely of natural materials, with the appearance and viscosity of a true oleoresin. Product is approved by MID as a meat flavoring and may be so labeled.—Fritzsche Brothers, Inc., New York City.

Circle 470 on Inquiry Card

CIRCLE 114 ON INQUIRY CARD

CIRCLE 115 ON INQUIRY CARD →

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BY-PASS VALVES. Gives features and detailed installation instructions for water conditioner units. 2p.—Sall Bros. Co., Rockford, Ill. **(211)**

OILS. Gives data and recommended use for 11 straight distilled types with viscosities ranging from 55 SUS at 100F to 140 SUS at 210F. 1p.—Sun Oil Co., Philadelphia. **(212)**

PUMPS. Includes cross-sectional drawings with uses and applications of volatile liquid units. 6p.—Layne & Bowler, Inc., Memphis, Tenn. **(213)**

SILICONES. Describes variety of uses for this material and ways it can be employed to solve plant maintenance and operating problems. 2p.—General Electric Co., Waterford, N. Y. **(214)**

WATER TREATMENT. Discusses chemistry of coagulation applied to effective water treatment, practical approaches to problems, and solutions. 7p.—Nalco Chemical Co., Chicago. **(215)**

SPECIAL MACHINERY. Introduces company's services in design, development, and manufacture of special machinery to solve unusual packaging, processing, and production problems. 4p.—Thiele Engineering Co., Hopkins, Minn. **(216)**

MECHANICAL SHAFT SEALS. Includes specs, data, and illustrations of types for rotating units. 4p.—Syntron Co., Homer City, Pa. **(217)**

CENTRIFUGAL PUMPS. Selection catalog gives illustrations, descriptions, and specs for single stage units. 11p.—Dean Bros. Pumps, Inc., 323 West 10th St., Indianapolis 7, Ind. **(Request on company letterhead)**

REFRIGERATION EQUIPMENT. Provides illustrations and specs of firm's complete line including air conditioners and heavy duty compressors. 34p.—Kohlenberger Engineering Corp., Fullerton, Calif. **(218)**

HEAT EXCHANGERS. Describes applications and engineering features of units with straight tubes and fixed tube sheets with shell sizes from 8" to 42". 6p.—American Standard Industrial Div., Detroit. **(219)**

STAINLESS STEEL TUBING. Lists sizes, grades, and types available, including technical data on chemical requirements, chemical analysis, etc. 20p.—Sumitomo Shoji New York, Inc., NYC. **(220)**

COLD STORAGE DOORS. Includes comprehensive data, illustrations, and applications of firm's complete line. 16p.—Chase Industries, Inc., Cincinnati. **(221)**

TUBE & PIPE SELECTION. Supplies standard methods of measurements, discussing both similarities and differences involved in measurement of fittings and fluid lines. 15p.—Aeroquip Corp., Jackson, Mich. **(222)**

JET COMPRESSORS. Details fixed nozzle, manually controlled spindle, and automatically controlled spindle types. 15p.—Schutte & Koerting Co., Cornwells Heights, Pa. **(223)**

ADJUSTABLE SPEED DRIVES. Outlines complete line of units for applications in ¾ to 2500 hp. drive range. 6p.—The Louis Allis Co., Milwaukee. **(224)**

PROCESSING

CRUSHERS. Provides specs and illustrations of saw tooth and vertical cone units with design and dimensional data included. 6p.—Young Machinery Co., Inc., Muncy, Pa. **(225)**

BLENDERS. Gives specs, dimensions, and capacities of sanitary design units for mixing of powders, granulars, pastes, or liquids. 4p.—First Machinery Corp., Brooklyn, N. Y. **(226)**

WHEY DISPOSAL. Shows how a troublesome waste can become a profitable by-product for milk plant operators. 4p.—Hall & Co., Inc., Albany, N.Y. **(227)**

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DRYER-BLENDER. Introduces new one-cubic foot capacity conical unit for use in small quantity batch drying and blending. 2p.—Pfaudler Permutit, Inc., Rochester, N.Y. **(229)**

TWO-WAY ROTARY VALVE. Details unit for processing systems where complete freedom from contamination is required. 2p.—Sprout, Waldron & Co., Inc., Muncy, Pa. **(230)**

MIXERS. Describes light, medium, and heavy duty double arm units for processing of viscous fluids and semi-solids. 8p.—J. H. Day Co., Cincinnati. **(231)**

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DRY FEEDERS. Provides charts and graphs showing cubic feet/min capacities of units at various rpm's.—Tower Iron Works, Inc., Providence, R.I. **(233)**

STRAINERS. Details over 600 units showing wide selection of available body materials, end connections, pressure ratings, and sizes. 12p.—Leslie Co., Lyndhurst, N.J. **(234)**

SPRAY DRYERS. Includes specs on capacity, air heating, chamber sizes and construction, atomization, duct arrangement, product collection, and accessory instrumentation. 4p.—Bowen Engineering, Inc., North Branch, N.J. **(235)**

PACKAGING

FOLDER-GLUER. Gives specs and illustrations of new model designed to assure uninterrupted, high-speed, low-manpower production of corrugated boxes. 20p.—S&S Corrugated Paper Machinery Co., Inc., Brooklyn, N.Y. **(239)**

CARTON FILLER & SEALER. Introduces unit for handling variety of sizes at speeds up to 80 cartons/min., including unique method for fast changeover. 4p.—Triangle Package Machinery Co., Chicago. **(240)**

PLASTIC VESSELS. Describes filament-wound, reinforced types, including design and application data graphs. 6p.—Lamtex Industries, Inc., Farmingdale, N.Y. **(241)**

CLIP CLOSER. Catalog sheet demonstrates uses and features of new machine for clip closing of packages.—Benckiser, Inc., Ridgefield, N.J. **(242)**

ACETATE PACKAGING. Describes present and potential uses of material to solve variety of packaging problems. 4p.—Celanese Corp. of America, N.Y.C. **(243)**

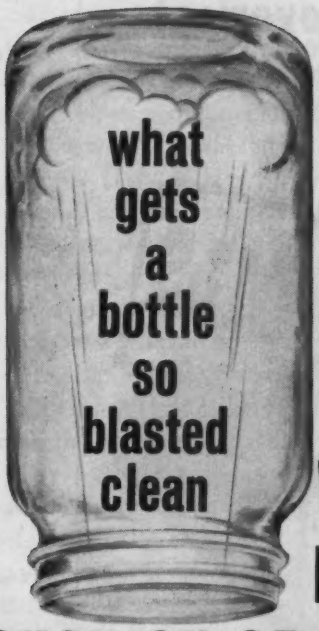
POLYSTYRENE FOIL. Describes many features of biaxially oriented type which offers excellent clarity and gloss, high yield and low cost, and good temperature performance. 4p.—Visking Co., Chicago. **(244)**

CAN SORTERS & UNCASERS. Details new units which automatically uncase, align, and orient for filling, almost every type of can—in reshipper cartons, shipper trays, bags, or bulk. 8p.—Atkron, Inc., Cuyahoga Falls, O. **(245)**

CELLOPHANE. Gives characteristics and uses of new type, heavy-gauge, polymer coated film with superior strength and barrier properties. 4p.—American Viscose Corp., Philadelphia. **(246)**

CASE SEALER. Describes compact unit that automatically tape seals top and bottom of up to 30 cases/min.—General Corrugated Machinery Co., Inc., Palisades Park, N.J. **(247)**

(Continued On Page 118)



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The revolutionary Pneumaclean! Based upon a unique and exclusive handling concept — resilient, continuous neoprene tubes — the Pneumaclean effortlessly cleans 500 containers per minute using the forces of gravity coupled with air pressure.

Here's how: neoprene pillows of air tubes firmly grip the containers as they whirl around the drum pulleys. Centrifugal force and gravity dislodge heavy matter from the inverted containers, which are then blasted free of dust, lint, and other remaining particles by a powerful "10 for 1" air jet system.

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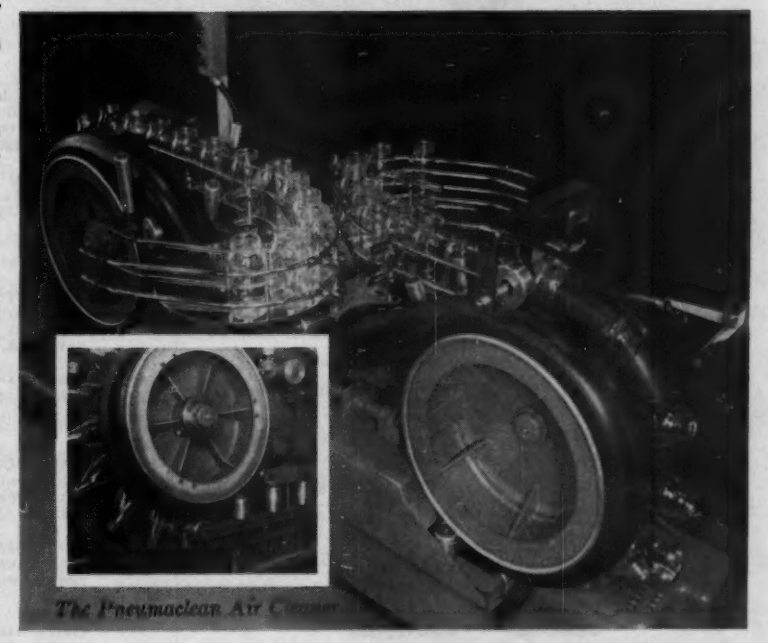
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- Impervious to animal, vegetable and mineral oils.
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PLASTICS PROPERTIES. Table shows significant physical, electrical, chemical, and optical properties of nine thermoplastic materials. 2p.—Cadillac Plastic & Chemical Co., Detroit. **(249)**

SANITATION & MAINTENANCE

PROTECTIVE LININGS. Depicts uses of liners for drums, cans, pails, and cartons, including specs, sizes, and types available. 18p.—Protective Lining Corp., Brooklyn, N.Y. **(251)**

TILE. Gives illustrations of industrial applications and typical installations. 8p.—Murray Tile Co., Lewisport, Ky. **(252)**

ENGINEERED MAINTENANCE. Tells how food processing plants may obtain, without charge, a plant housekeeping and sanitation program custom engineered to their specific needs.—Puritan Chemical Co., Atlanta. **(253)**

SANITARY WAX. Introduces new floor wax that kills bacteria and provides protection from staphylococcus. 4p.—National Chemsearch Corp., Dallas. **(254)**

POWDERED ACID CLEANER. Introduces new product for increased safety in acid cleaning and descaling operations. 4p.—DuBois Chemicals, Inc., Cincinnati. **(255)**

FLOOR REPAIR. Introduces new process and formula that is dense and tough, will withstand heaviest industrial loads and yet may be completely installed and ready for use in 60 seconds. 4p.—The Monroe Co., Inc., Cleveland. **(256)**

SPRAY CLEANING UNIT. Describes new portable unit for sanitizing storage tanks.—The Diversey Corp., Chicago. **(257)**

INGREDIENTS

FLAVORING. Lists bakery and confectionary flavors, oleospice spice concentrates, and true and concentrated fruit extracts, including prices. 25p.—Ungerer & Co., N.Y.C. **(261)**

HAM CURING FORMULA. Describes food grade sodium hexametaphosphate scientifically designed for curing of hams.—Benckiser, Inc., Ridgefield, N.J. **(262)**

MATERIALS HANDLING

POWER GATES. Explains how power gates can reduce costs per stop by increasing the number of stops per day that one delivery truck can make. 20p.—Young Spring & Wire Corp., Bowling Green, O. **(266)**

OVERHEAD CONVEYOR. Describes how transportation, storage, processing, and accumulation are combined in one integrated unit. 6p.—Rapistan-Keystone, Inc., Detroit. **(267)**

PNEUMATIC CONVEYORS. Provides illustrations of major components, diagramatic sketches showing system variations, and installation photos. 8p.—Young Machinery Co., Muncy, Pa. **(268)**

TRUCK LEASING. Explains plan providing industrial truck rent-lease-purchase arrangements tailored to fit any requirements.—Hyster Co., Portland, Ore. **(269)**

PALLETLESS CLAMP. Illustrates and describes carton clamp attachment designed to reduce handling costs by eliminating pallets. 4p.—Clark Equipment Co., Battle Creek, Mich. **(270)**

CUT HANDLING COSTS. New handbook discusses handling problems and methods of cost reduction. 80p.—Automatic Transportation Co., Chicago. **(271)**

BLOWERS. Gives performance curves and other technical data on two new units for pneumatic unloading of bulk trailers, especially flour, sugar, or other granular materials. 4p.—CycloBlower Co., York, Pa. **(272)**

BATTERY CHARGERS. Describes complete line of units for 12-, 15-, and 18-cell industrial truck batteries. 6p.—The Electric Autolight Co., Conshohocken, Pa. **(273)**

(Continued On Page 120)

What anyone concerned with fat or starch in food should realize

Our emulsifiers now do more than emulsify. For some years we have trumpeted the virtues of *Myverol® Distilled Monoglycerides* in fat-based foods. We have shown how they regulate cake texture; how they maintain the homogeneity of peanut butter over a wide temperature range, keep it from sticking to the roof of the mouth, and help release full peanut flavor; how they cost less per unit of effect.

Now we add another string to our bow. In *starch-based* foods, *Myverol Distilled Monoglycerides* have proved their ability to produce an entirely different set of effects by complexing dissolved amylose and thus preventing stickiness and pastiness after cooking. A very small percentage adds to the convenience and quality of dehydrated potato products the look and taste of fresh whipped potato; try most any popular brand and see. Hot cereals can be kept from turning jellylike after cooking. The stiffness or lack thereof in a starch-based pudding or sauce can now be engineered precisely.

Myverol Distilled Monoglycerides are exempt from the Food Additives Amendment. They are prepared from the glycerolysis of edible fats or oils by a unique method which involves segregation of fat molecules in the vapor phase. You get technical data and prices on them by writing to ***Distillation Products Industries,*** Rochester 3, N. Y. Sales Offices: New York and Chicago • W. M. Gillies, Inc., West Coast • Charles Albert Smith Limited, Montreal and Toronto.

This gives you an idea of what *Myverol Distilled Monoglycerides* are like, but you really have to try them to find out.

	Type 18-00	Type 18-07	Type 18-40	Type 18-85
Source material	Fully hydrogenated lard	Fully hydrogenated cottonseed oil	Prime steam lard	Refined cottonseed oil
Monoester content (min.)	90.0%	90.0%	90.0%	90.0%
Saponification value	155-165	155-165	155-165	155-165
Iodine value	1	2	54 (approx.)	85 (approx.)
Glycerol content (max.)	1.0%	1.0%	1.5%	1.0%
F.F.A. (max.): as oleic	1.5%	1.5%	1.5%	1.5%
Specific gravity	0.96 at 75°C	0.94 at 75°C	0.96 at 60°C	0.96 at 60°C
Congeal point (approx.)	68°C	67°C	47°C	46°C
Clear point (approx.)	73°C	76°C	60°C	56°C
Form	Bead	Bead	Plastic homogenized fat	Plastic homogenized fat
Net shipping weight, lb.	250	250	400	400

distillers of monoglycerides made from natural fats and oils

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Also . . . vitamin A in bulk for foods and pharmaceuticals

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INSTRUMENTS

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GAUGING SYSTEMS. Describes operation methods, and specs for units to be applied in measurement of liquid, solid, or slurry levels. 4p.—The Ohmart Corp., Cincinnati. **(277)**

AQUAMETERS. Provides descriptive specs of two models for rapid, accurate, and convenient determination of samples' moisture content. 2p.—Beckman Instruments, Fullerton, Calif. **(278)**

CONVEYOR BELT WEIGHING. Introduces new instrument which multiplies belt travel with belt loading to produce direct read-out of true weight being conveyed. 2p.—B-I-F Industries, Inc., Providence, R.I. **(279)**

MARKETING

TV ADVERTISING. Detailed study asks what kind of people the general public identifies as shoppers at individual stores, kinds of goods associated with stores, public's attitude toward store qualities, with effects of television traced in each area. Minneapolis-St. Paul area is considered for test purposes.—Television Bureau of Advertising, N.Y.C. **(291)**

MARKETING INTELLIGENCE. Describes marketing intelligence with outline of vital areas of consideration for market research or advertising problems. Includes 12 key marketing questions for media executives and complete outline of firm's marketing services with costs and methods briefly described. 16p.—Richard Manville Research, Inc., N.Y.C. **(292)**

INCREASE SALES. Outlines six ways to do something about sluggish sales of grocery products. Each method is accompanied by illustrative charts and examples. Includes special note on subject of profits. 16p.—Market Research Corp. of America, N.Y.C. **(293)**

MARKETING REPORTS. Lists periodic reports of the Agricultural Marketing Service, tells where and how you can get the ones you want, and approximately when most of them will be issued during '61. 39p.—U. S. Dept. of Agriculture, Washington, D.C. **(294)**

MANAGEMENT

WEATHER SERVICES. Outlines ways in which small marketers can use weather information to improve their operations. By using such information, businessmen can minimize weather risks and losses. 4p.—Small Business Administration, Washington, D.C. **(301)**

SERVICE AWARDS. Presents statistics on preferences among employees concerning company service awards, their value as an incentive, which type of award is best. 4p.—Hamilton Watch Co., Lancaster, Pa. **(302)**

AMA SEMINAR PROGRAMS. Provides detailed information on dates, locations, and subject matter to be covered in scheduled seminars and workshops from March thru June, '61. 95p.—American Management Assn., N.Y.C. **(303)**

LABOR MARKET & PLANT LOCATION. Covers each area of the country, giving vital statistics on available labor (skilled and unskilled), average wages, and worker efficiency, for selection of plant location to fit your needs. 14p.—Dartmouth College, Hanover, N. H. **(304)**

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- unobstructed, easy to clean stainless steel interior
- eliminate complicated steam jackets
- provides uniform, efficient low cost heating

Have you thought of these lately with regard to your holding tank problems?

Panel-Coils are rated at 125 psi steam pressure; available for 66 to 1587 gallon capacity tanks and larger regardless of height or diameter.

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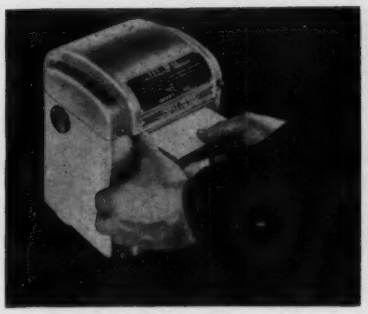


Meter Printed Batch Tickets . . . New Tool for Quality Control

A meter that automatically prints a ticket after each delivery now offers permanent proof of liquids fed to batches. Called the Print-O-Meter, it prints exact quantities, with serial numbers and code letters to identify the batch and/or station.

Operation is fool-proof. The ticket is inserted and locked in place in the meter before delivery. The ticket cannot be removed before being printed out.

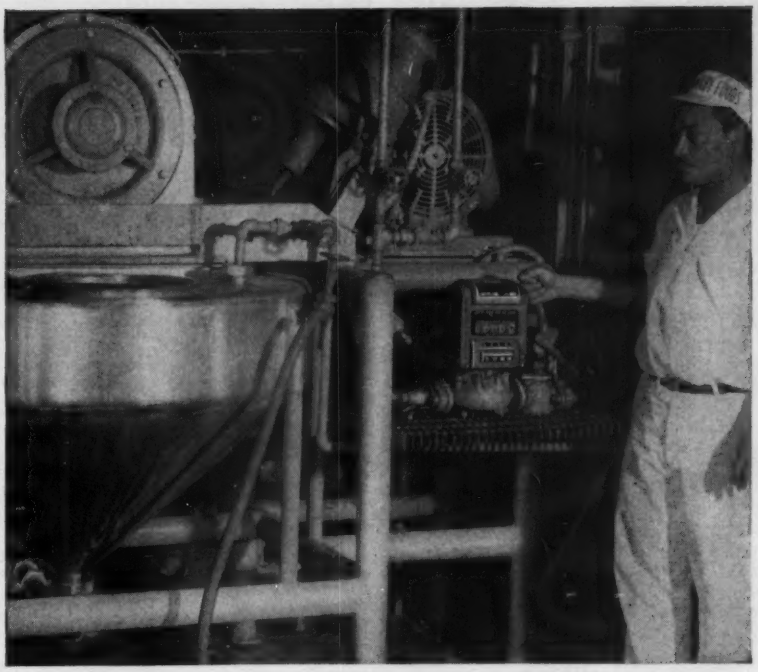
As a dispute-free record, it's a strong incentive for careful handling of liquids, and automatically improves quality control. The printed tickets aid inventory, too, and can even be used to indicate daily or weekly production rates.

The Print-O-Meter is available with Neptune Meters in sizes from 1 to 4 in.; capacities 5 to 500 gpm.

THESE ARE JUST A FEW OF THE LIQUIDS METERED BY NEPTUNE. ASK ABOUT OTHERS

Acetates	Latex*
Acetic Acid*	Lime Water
Acetone	Liquid Soap
Alcohol	Liquid Sugar
Ammonium Nitrate*	Magnesium Sulphate*
Ammonium Phosphate*	Mercury*
Antiseptics*	Methylated Spirits
Banana Oil	Nitrocellulose Lacquer
Beer	Paint, Varnish
Benzol	Perfume
Boric Acid*	Phenol*
Bunker "C" Oil	Phosphoric Acid*
Carbolic Acid*	Picric Acid*
Carbon Tetrachloride	Polymer, Molten
Castor Oil	Potassium Carbonate
Catsup*	Potassium Hydroxide*
Chocolate	Potassium Phosphate*
Chromic Acid*	Rum
Coconut Oil	Salicylic Acid*
Condensate	Shellac, Alcohol Sol.
Copper Sulphate*	Size Solution
Corn Molasses	Sodium Carbonate
Corn Syrup	Sodium Hydroxide*
Diethylene Glycol	Sodium Nitrate*
Dimethyl Phthalate	Sodium Silicate
Formaldehyde	Starch Solution
Formic Acid*	Sulfur Dioxide*
Fruit Juices*	Tallow
Fuel Oil, Hot	Trichloroethylene
Glue, Water Sol.	Urea*
Glycerine	Vinegar*
Insecticides*	Water
Kerosene	Wax Emulsions
Ketones*	Wine
Lactic Acid*	Xylol

* Stainless Steel Meter



Accurate Neptune Meters add "FINISHING TOUCH" to Gerber Baby Foods

Precise volumetric control in finishing canned foods is a common problem. Gerber Products Company set about solving it with all the meticulousness they could muster for their sensitive baby market. Formerly they carefully weighed all ingredients of the batch, then introduced water manually up to a mark in the cone tank. Occasional human errors were costly.

Cure was to install two Neptune hot water meters with Auto-Stop quantity control. The operator simply pushes buttons to set the quantity required by the formula, and opens the valve. The meter shuts off automatically . . . delivers the exact quantity every time.

In another department Gerber uses Neptunes for accurate batching of liquid sugar and water. Improves quality control, reduces traffic on the mixing platform, saves time, and improves housekeeping.

You, too, can improve quality, and save time and materials with Neptune liquid meters.

GET THE FACTS

Ask for helpful Meter Data Bulletin 566 KF See Neptune Data Pages in Chemical Engineering Catalog.

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CIRCLE 121 ON INQUIRY CARD

FORMULA FOR PROFITABLE OPERATION

FOOD DRYERS by SARGENT

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- A dryer designed for your process, your required production.
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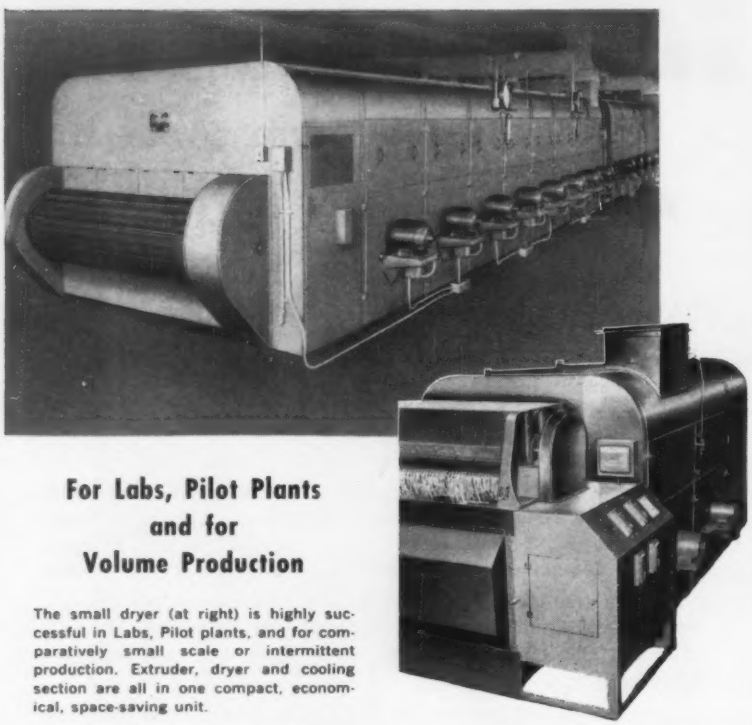
- Built by a company whose dryers lead the field — a company whose long experience makes a guarantee really mean something — a company that will say, "We stand unequivocally behind every machine we build."



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The 14-section, 2-stage dryer (above) is engineered for high tonnage per hour production. Extruder, or granulator, together with baking and curing and cooling sections may be added by incorporating the same housing, where desired. Heat source for any SARGENT may be gas, steam or electricity. Airflow may be up, down, or in combination.

SARGENT equipment is working wherever there's a drying process in the food industry, from milk curd to poultry stuffing and protein flour. They may be engineered for complete push-button control of the entire drying-cooling operation. They are always designed for your product and your production. May we tell you more?

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Useful New Books

Food & Color Additives

FOOD AND COLOR ADDITIVES DIRECTORY. *Information for Industry, Inc., 1000 Connecticut Ave., N.W., Washington 6, D.C. 1961. 5 Vol. Price: $150.00 (initial set of 5 Vol.); $150.00 per year (monthly revision service).*

A new directory service which will keep abreast of the many official changes concerning food color additives is now available.

Designed to meet the needs brought about by passage of the Food Additives Amendment of '58, and the Color Additives Amendment of '60, this directory will serve as a simple, quick, complete, and current reference to all food and color additives which have received official government recognition.

New Marketing Developments

DYNAMIC MARKETING FOR A CHANGING WORLD. *Ed. by Prof. Robert S. Hancock. American Marketing Assn., 27 E. Monroe Street, Chicago 3. 1960. 600p. Price $5.00 (members); $7.50 (non-members).*

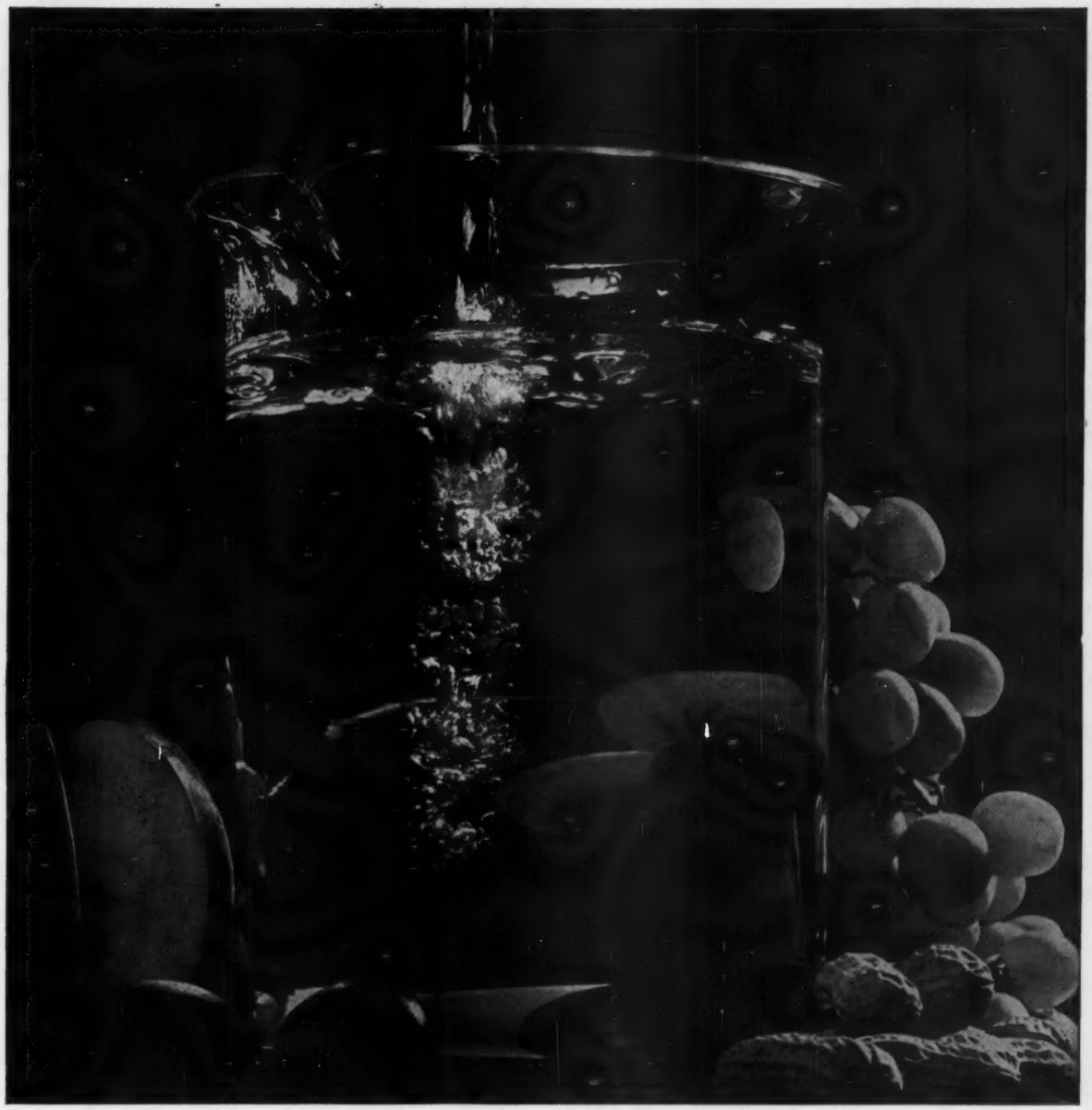
Recording the latest developments in the marketing field, this new publication contains speeches presented at the conference on marketing sponsored by the American Marketing Assn. last June.

These proceedings are a veritable reference book in the field of scientific marketing and a valuable addition to the library of any astute marketing practitioner.

Booklets & Reports

IMPACT OF AUTOMATION *(Bulletin No. 1287). U.S. Govt. Printing Office, Washington 25, D.C. 113p. Price: 60¢.* A collection of 20 articles about technological change from The Monthly Labor Review.

ADVANTAGES AND DISADVANTAGES OF AUTO FLEET LEASING. *Foundation for Management Research, 121 W. Adams Street, Chicago 3. 1961. 28p.* Contains new data concerning shift of industry toward leasing auto fleets.



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CIRCLE 123 ON INQUIRY CARD

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Preparing Protein-Rich Flour by Impacting and Air-Classifying. — B. J. Sullivan, Russell-Miller Milling Co., Minneapolis. No. 2,957,632.

Malting Cereal Grain by Adding Sodium Bromate, Steeping in Aqueous Liquor, Germinating and Then Arresting Germination.—A. Macey, Associated British Maltsters Ltd., Newark-on-Trent, Eng. No. 2, 960,409.

Improving Flavor of Meats by Injecting Sterilized Mycelium of *Aspergillus* Into Freshly Slaughtered Carcass.—B. E. Williams, Hodges Research & Development Co., N. Y. C. No 2, 961,321.

Removing Rat Excreta Pellets and Insect-Damaged Kernels From Corn by Compression and Air Separation. — J. R. Dilley, USDA. No. 2,962,230.

Storing Cottage Cheese by Adding Brine Solution to Curd, Holding below 25 F. and Washing Brine From Curd.—H. Leber, Dairymen's League Co-Operative Assn., Inc., N. Y. C. No. 2,962,379.

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Producing Tea Concentrate by Extracting, Adjusting pH, Centrifuging, Adding Suspending Agent, Packing in Gas-Tight Container and Freezing. — F. R. Greenbaum, Kwik Kafe Coffee Processors of America, Inc., Hatboro, Pa. No. 2,963,368.

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Manufacturing Soft-Type Cheeses by Acidifying Milk and Mechanically Separating Curd From Whey.—Z. D. Roundy, Armour & Co., Chicago. No. 2,963,370.

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Flame Sterilizing and Cleaning Conveyorized Open-End Cans.—H. W. Winkler, The Borden Co., N. Y. C. No 2,963,389.

Recovering Active, Stable, Substantially Sterile, Soluble Proteolytic Enzyme Composition From Crude Papain.—D. R. Schwarz, Schwarz Laboratories, Inc., Mt. Vernon, N. Y. No. 2,968,632.

PACKAGING

Machine for Positioning Cans in Side-by-Side Relation So Their Open Ends Can Be Engaged by Tines of Transfer Fork.—W. A. Heaton, Continental Can Co., N.Y.C. No. 2,959,270.

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System of Opening Closure Flaps of Conveyed Carton, Inserting Group of Filled Containers Into Open End and Closing Flaps.—E. R. Norwood, National Dairy Products Corp., Chicago. No. 2,961,811.

Device for Injecting Blanket of Inert Gas for Enveloping Open Upper-End Portions of Filled Jars Traveling Between Filler and Capper. — S. L. Harmon, Owens-Illinois Glass Co., Toledo. No. 2,962,060.

EQUIPMENT

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PRODUCTS

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Chocolate Base Flavor Factor Consisting of Heat-Reacted Partially Hydrolyzed Unfermented Green Cacao Protein and Hydrolyzed Cacao Carbohydrate.—I. I. Rusoff, General Foods Corp., White Plains, N. Y. No. 2,965,490.

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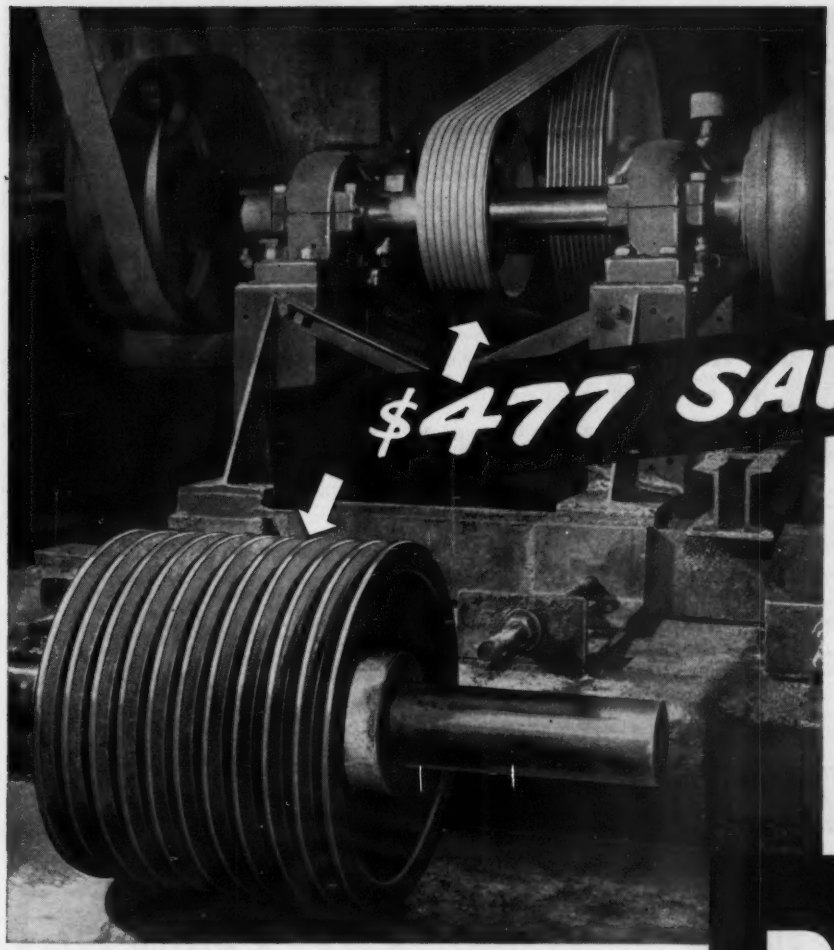

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1—Buflovak 6" x 8" vac. drum dryer.

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1—Bowen lab. spray dryer, T304 SS.

1—York Freon 12 comp., 6¾ x 5, 40 HP.

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10—Sharples #AS-16V inconel centrif., 3 HP.

1—Tolhurst 48" T304 SS susp. centrifugal.

6—A.T.&M. 40" T304 SS susp. basket centrif.

12—Buflovak 42" x 120" double drum dryers.

1—Niagara #53-36, 54 sq. ft. T304 SS filter.

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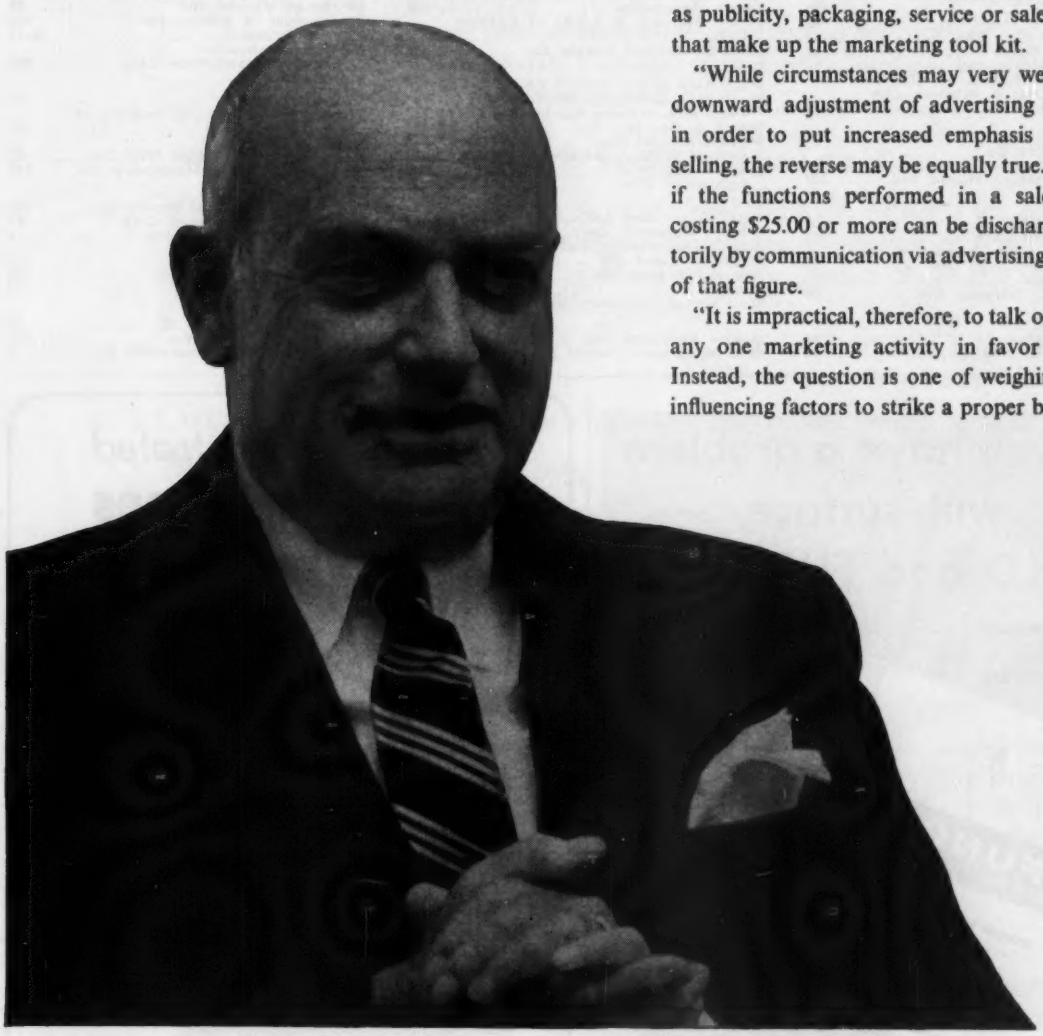

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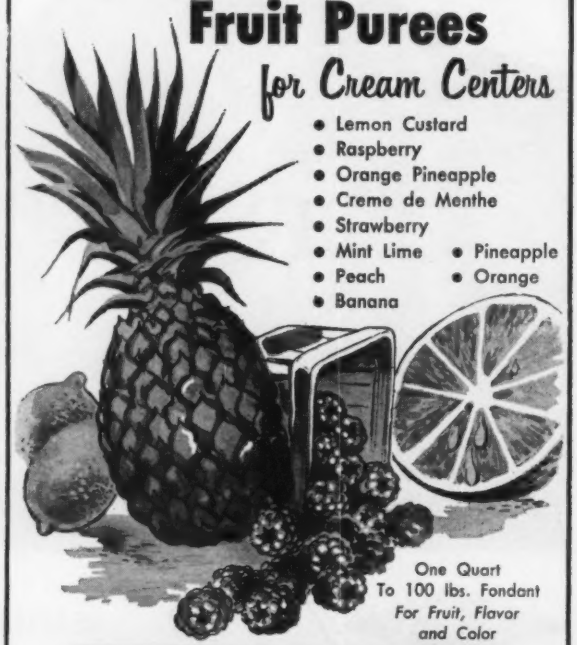

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- ☐ 4. Other

B—Principal Product

- ☐ 1. Bakery Products
- ☐ 2. Beverages
- ☐ 3. Confectionery
- ☐ 4. Fruits & Vegetables
- ☐ 5. Grain Products
- ☐ 6. Meat, Poultry, Fish
- ☐ 7. Milk & Milk Products
- ☐ 8. Sugar & Sugar Products
- ☐ 9. All Other Foods
- ☐ 10. Multi-Foods (2 or More)

←**CHECK** *Important Must Information*

WRITE—*name, title, company and address*

CIRCLE—*number of items you want*

MAIL

70 **Paint film.**
Steelcote Mfg. Co.

454 **Plastic floor finish**
Monroe Co., Inc.

97 **Refrigeration.**
U. S. Plywood, Engineered Products Dept.

252 **Tile.**
Murray Tile Co.

Disintegration Equipment

12 **Corn cutter.**
Food Machinery & Chemical Corp.

232 **Corn cutter.**
Food Machinery & Chemical Corp.

225 **Crushers.**
Young Machinery Co., Inc.

6 **Dicer.**
Urschel Labs., Inc.

423 **Dry materials disintegrator.**
Pallmann Pulverizers Co.

400 **Instrumented roll mill.**
Charles Ross & Son Co.

44 **Pulverizing machinery.**
Pulverizing Machinery Co.

Electrical Equipment

273 **Battery chargers.**
Electric Autolight Co.

Equipment & Truck Leasing

269 **Truck leasing.**
Hyster Co.

Forming Equipment

360 **Rotary meat former.**
Hollymatic Corp.

Freezing Equipment & Supplies (Product)

339 **Continuous chiller.**
Pappas Industries

362 **In-transit refrigeration system.**
Linde Co.

Heat Transfer Equipment

219 **Heat exchangers.**
American Radiator & Standard Sanitary Corp.

Ingredients & Additives

95 **Apple pectin.**
Speas Co.

98 **Ascorbic acid.**
Merck & Co.

19 **Beta carotene.**
Hoffman-LaRoche, Inc.

54 **Chemicals.**
Du Bois Chemicals

16 **Chemicals.**
Miles Chemical Co.

28 **Enzymes.**
Rohm & Haas

105 **Flavoring.**
Firmenich Inc.

56 **Flavoring.**
Hercules Powder Co., Inc.

468 **Flavoring cultured butter.**
A. E. Illes Co.

136 **Flavoring.**
International Flavors & Fragrances

4 **Flavoring.**
Merck & Co.

135 **Flavoring.**
Norda

261 **Flavoring.**
Ungerer & Co.

53 **Flavoring.**
R. D. Webb & Co., Inc.

139 **Fruit purees.**
A. E. Illes Co.

8 **Gum.**
Hercules Powder Co.

262 **Ham curing formula.**
Benckiser, Inc.

467 **Lactic-culture technique.**
B. E. P. Industrial Equipment

11 **Lemon juice.**
Sunkist Growers

119 **Monoglycerides.**
Distillation Products Industries

470 **Oleoresin simultant.**
Fritzsche Brothers, Inc.

402 **Product conditioner.**
Johnson-March Corp.

59 **Salt.**
Morton Salt Co.

62 **Seasonings for freeze dried.**
Dodge & Olcott, Inc.

92 **Silicone defoamer.**
Dow Corning Corp.

111 **Starches & syrups.**
Hubinger Co.

469 **Whey solids.**
Western Condensing Co.

66 **Yeast-protein hydrolysate.**
Red Star Yeast & Products Co.

Instruments, Measurement & Control

278 **Aquameters.**
Beckman Instruments

279 **Conveyor Belt weighing.**
B-I-F Industries, Inc.

414 **Dry additive feeder.**
Exact Weight Scale Co.

94 **Flow meter sanitary.**
T. E. A., Inc.

277 **Gauging systems.**
Ohmart Corp.

32 **Graph line recorder.**
Autolite Industrial Instrument Div.

121 **Meters.**
Neptune Meter Co.

421 **Moisture analyzer.**
Moore-Milford Corp.

418 **Process refractometer.**
H & H Controls Co.

420 **Recording thermometer.**
Manning, Maxwell & Moore, Inc.

88 **Scale.**
Thayer Scale Corp.

276 **Temperature controllers.**
Fenwal, Inc.

90 **Thermometers.**
Sarco Co., Inc.

405 **Time temperature unit.**
Minneapolis-Honeywell Regulator

422 **Torsion balance.**
Torsion Balance Co.

Lubrication & Fuel

212 **Oils.**
Sun Oil Co.

Management Services

303 **AMA Seminar Programs.**
American Management Assn.

293 **Increase sales.**
Market Research Corp. of America

292 **Marketing Intelligence.**
Richard Manville Research

302 **Service Awards.**
Hamilton Watch Co.

301 **Weather Services.**
Small Business Administration.

Materials Handling

22 **Conveyor belt.**
La Porte Mat & Mfg. Co.

118 **Conveyor belting.**
Globe Woven Belting Co., Inc.

202 **Conveyor belting.**
B. F. Goodrich Industrial Products Company.

203 **Conveyor equipment.**
Mathews Conveyor Co.

336 **Conveyor, monorail.**
F. H. Bathke Co.

267 **Conveyors, overhead.**
Rapistan-Keystone, Inc.

268 **Conveyors, pneumatic.**
Young Machinery Co.

271 **Cut Handling Costs.**
Automatic Transportation Co.

233 **Feeders, dry.**
Power Iron Works, Inc.

204 **Feeders, vibratory.**
Eriez Mfg. Co.

109 **Flour hose.**
B. F. Goodrich Industrial Products Company.

270 **Palletless clamp.**
Clark Equipment Co.

266 **Power Gates**
Young Spring Wire Corp.

102 **Texite wheel.**
Albion Industries, Inc.

228 **Wire baskets.**
Newark Wire Cloth Co.

Mixing Equipment

226 **Blenders.**
First Machinery Corp.

229 **Dryer-Blender.**
Pfaudler Permutit, Inc.

349 **Egg processing system.**
Creamery Package Mfg. Co.

413 **High speed disperser.**
Charles Ross & Son Co.

231 **Mixers.**
J. H. Day Co.

15 **Processing equipment.**
Cherry-Burrell

Moisture Removal Equipment

58 **Evaporator.**
Pfaudler Permutit Inc.

122 **Food dryers.**
C. G. Sargents' Sons Corp.

23 **Freeze drying equipment.**
American Sterilizer, Scientific & Industrial Dept.

84 **Freeze drying equipment.**
N. R. C. Equipment Co.

235 **Spray dryers.**
Bowen Engineering, Inc.

Packaging Equipment

347 **Automatic egg packer.**
Big Dutchman Automatic Poultry Feeder Co.

101 **Can closing machines.**
Angelus Sanitary Can Co.

245 **Can sorters & uncasers**
Atkron, Inc.

240 **Carton filler & sealer.**
Triangle Package Machinery Co.

Expires June 30, 1961

CHECK→ ***Important Must Information***

IMPORTANT MUST INFORMATION

Please check in A & B below best description

WRITE—*name, title, company and address*

CIRCLE—*number of items you want*

MAIL

A—Your Function

- ☐ 1. Administrative
- ☐ 2. Plant Operating
- ☐ 3. Tech.-Engineering
- ☐ 4. Other

B—Principal Product

- ☐ 1. Bakery Products
- ☐ 2. Beverages
- ☐ 3. Confectionery
- ☐ 4. Fruits & Vegetables
- ☐ 5. Grain Products
- ☐ 6. Meat, Poultry, Fish
- ☐ 7. Milk & Milk Products
- ☐ 8. Sugar & Sugar Products
- ☐ 9. All Other Foods
- ☐ 10. Multi-Foods (2 or More)

Name ..... **Title** .....

Company .....

Address .....

City ..... **Zone** ..... **State** .....

Do you wish to receive FOOD Engineering? YES ☐ NO ☐

Please send me further information on the items circled below—

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
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461	462	463	464	465	466	467	468	469	470	471	472	473	474	475	476	477	479	479	480

Where ads offer more than one item, I've written key number and identity below

.....

247 **Case sealer.**
Corrugated Machinery Co., Inc.

410 **Case set-up & packing unit.**
A-B-C Packaging Machine Corp.

417 **Casing stuffer.**
De Laval Separator Co.

242 **Clip closer.**
Benckiser, Inc.

359 **Closematic packager.**
Continental Can Co.

127 **Coder.**
Gottscho

113 **Cup filler.**
Triangle Package & Machinery Co.

357 **Film packager.**
General Packaging Equipment Co.

239 **Folder-Gluer.**
S & S Corrugated Paper Machinery Co.

356 **Head seal unit.**
Weyerhauser Co.

406 **Heat sealer.**
Bag-O-Matic Packaging Equipment Co.

401 **Hot-melt adhesive system.**
National Starch & Chemical Corp.

117 **Packaging equipment.**
Pneumatic Scale

46 **Packaging Machinery.**
Gas Atmospheres, Inc.

114 **Screw capper.**
Resina Automatic Machinery Co.

Packaging Materials

243 **Acetate packaging.**
Celanese Corp. of America.

355 **Adapta-pak packaging system.**
Container Corp of America.

314 **Boxes.**
Milprint, Inc.

315 **Boxes.**
Richardson Taylor-Globe Corp.

313 **Boxes.**
Waldorf Paper Products Co.

248 **Boxes, corrugated.**
Hinde & Dauch Div.

51 **Boxes, corrugated.**
Owens-Illinois.

363 **Can, foil.**
R. C. Can Co.

345 **Carton, fast forming egg.**
Central Fiber Products Co.

346 **Carton, fast forming egg.**
Packaging Corp. of America.

323 **Carton, frozen food.**
Container Corp. of America.

27 **Carton liners.**
Riegel Paper Corp.

348 **Carton, three dozen egg.**
Bloomer Brothers Co.

322 **Carton, wax free.**
Sealright Co.

246 **Cellophane.**
American Viscose Corp.

342 **Cellophane overwrapping.**
E. I. duPont.

312 **Clip for multi-packs.**
Brunsing & Sons, Inc.

85 **Containers.**
American Can Co.

316 **Containers.**
International Paper Co.

351 **Egg carton's floating cushion.**
KVP Sutherland Paper Co.

201 **Extensible paper.**
Clupak, Inc.

321 **Fibre 1PX board.**
International Paper Co.

364 **Flavor foil.**
Morris Shorr.

326 **Grocery sack.**
Olin-Mathieson Chemical Corp.

358 **Insultainer.**
Raven Industries.

115 **Package improvement.**
Olin-Mathieson Co.

325 **Plastic (selcon).**
Celanese Corp. of America.

324 **Plastic trays.**
Haveg Industries, Inc.

241 **Plastic vessels.**
Lamtex Industries, Inc.

103 **Plastics.**
Phillips Chemical Co.

249 **Plastics properties.**
Cadillac Plastic & Chemical Co.

317 **Poly cubitainer.**
Hedwin Corp.

244 **Polystyrene foil.**
Visking Co.

251 **Protective linings.**
Protective Lining Corp.

311 **Redesigned Sankn package.**
Lippencott & Margulies, Inc.

320 **Sauce mix package.**
Lord Baltimore Press.

319 **Slim package.**
Container Corp. of America.

318 **Slip-on hood.**
Riegel Paper Corp.

411 **Teflon packing.**
Garlock, Inc.

5 **Wrappers.**
West Carrollton Parchment Co.

Pipes, Valves, Tubing, Spray Nozzles

17 **Equipment.**
Thermovac.

217 **Mechanical shaft seals.**
Syntron Co.

419 **Metering pump.**
Wallace & Tiernan Inc.

220 **Stainless steel tubing.**
Sumitomo Shoji New York Inc.

222 **Tube & pipe selection.**
Aeroquip Corp.

72 **Valves.**
Ladish Co.

211 **Valves, by pass.**
Sall Brothers Co.

415 **Valves, sanitary ball.**
Hydromatics, Inc.

230 **Valve, two way rotary.**
Sprout Waldron & Co., Inc.

96 **Water equipment.**
Strahman Valves, Inc.

Plant Services

452 **Automatic waste disposal.**
Buffalo Hammer Mill Corp.

253 **Engineered maintenance.**
Puritan Chemical Co.

256 **Floor repair.**
Monroe Co., Inc.

106 **Packaged CO_2 and nitrogen.**
Louis DeMarkus Corp.

227 **Whey disposal.**
Hall & Co., Inc.

Plant Site

304 **Labor market & plant location.**
Dartmouth College.

Power & Steam Generating Equipment

70 **Boilers.**
Orr & Sembower, Inc.

Power Transmission Equipment (Mechanical)

224 **Adjustable speed drives.**
Louis Allis Co.

125 **Sheave.**
Dodge Mfg. Corp.

Processing Equipment (Heat)

108 **Baking equipment.**
Werner Machinery Co.

350 **Barbecued chicken.**
Visking Corp.

26 **Infrared oven.**
Fostoria Corp.

407 **Ion water sterilization process.**
Sharf Mfg. Co.

120 **Panel-coil tanks.**
F. H. Langsenkamp Co.

216 **Special machinery.**
Thiele Engineering Co.

1 **Sterilizer.**
Stork & Co.

Pumps & Air Compressors

213 **Pumps.**
Layne & Bowler, Inc.

Separation Equipment (Dry)

338 **Poultry sizing bins.**
Paul Mueller Co.

416 **Sanitary screens.**
Orville Simpson Co.

234 **Strainers.**
Leslie Co.

Separation Equipment (Wet)

71 **Centrifuges.**
Sharples Corp.

123 **Filter Aids.**
Johns-Manville.

60 **Separators.**
Centrico, Inc.

Shipping Containers

344 **Fiberboard shipper.**
Mead Corp.

340 **Free draining poultry shipper.**
Stone Container Corp.

205 **Shipping containers, corrugated.**
Stone Container Corp.

403 **Shipping container, insulated.**
Avco Corp.

TV, Radio & Print

201 **TV Advertising.**
Television Bureau of Advertising.

Transportation & Automobile Equipment

404 **Hauling.**
Chevrolet Motor Div.

408 **Truck Line.**
International Harvester Co.

CIRCLE KEY NUMBERS ON OTHER SIDE OF CARD. WRITE NAME, ADDRESS—AND MAIL!

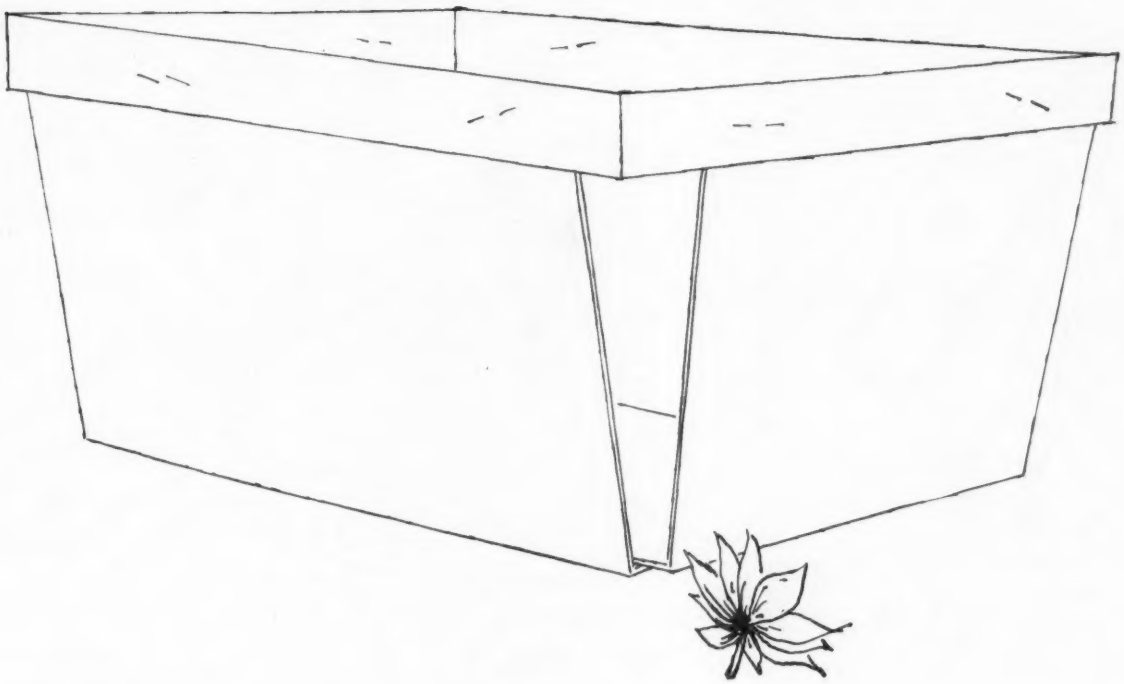
FIRST CLASS
PERMIT NO. 23708
PHILA. 39, PA.

BUSINESS REPLY MAIL
No Postage Stamp Necessary if Mailed in U. S.

POSTAGE WILL BE PAID BY

FOOD Engineering

The Computer Center
P.O. Box 7572, Philadelphia 4, Pa.

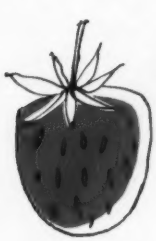


When all is said and done...

...NOTHING

TASTES SO TRUE

TO NATURE



Norda®

Flavor it with a favorite

Exclusive Basic Materials for: Candy and Chewing Gum, Dairy Products (Ice Cream and Cheese), Soft Drinks, Desserts (Puddings and Gelatins), Meat Products, Syrups, Bakery Products (Cake Mixes, Crackers, Snack Items), Pharmaceutical Products, Liquors and Cordials.

Write on your letterhead for free samples.

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CIRCLE 135 ON INQUIRY CARD

CIRCLE 136 ON INQUIRY CARD →

VISIT OUR BOOTH AND SUITE
DURING THE IFT MEETING
STATLER-HILTON HOTEL,
NEW YORK, MAY 7-11

WHICH FLAVORS WILL OUTSELL?

Identical flavors to the eye, yes . . . to the taste, no. The basic difference in each case is the unique flavor of one—perfected to outsell—developed by IFF.

Creating outstanding flavors for individual products is an experienced specialty of IFF. The result is a product which establishes brand demand, repeat sales, in a highly competitive market.

And if you are in the international market, IFF can minimize problems of supply. Uniform manufacturing and quality control in all of its plants throughout the world assure customers that IFF flavors, wherever ordered, remain the same from batch to batch.

For the flavors that outsell, contact IFF.

iff

FLAVOR DIVISION

INTERNATIONAL FLAVORS & FRAGRANCES INC.

417 Rosehill Place, Elizabeth 2, N. J.

Leading Creators and Manufacturers in the World of Flavor

ARGENTINA AUSTRIA BELGIUM BRAZIL CANADA ENGLAND FRANCE GERMANY HOLLAND INDONESIA ITALY NORWAY SOUTH AFRICA SWEDEN SWITZERLAND U.S.A.